**Determining the Purity of Ecstasy (MDMA): Strategies Utilized by Recreational Ecstasy Users in Victoria, British Columbia**

by

Melanie Callas
B.A., University of Victoria, 2012

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF ARTS

in the Department of Anthropology

**Supervisory Committee**

**Determining the Purity of Ecstasy (MDMA): Strategies Utilized by Recreational Ecstasy Users in Victoria, British Columbia**

by

Melanie Callas
B.A., University of Victoria, 2012

**Supervisory Committee**

Dr. Eric Roth (Department of Anthropology)
**Supervisor**

Dr. Andrea Walsh (Department of Anthropology)
**Departmental Member**

## Abstract

**Supervisory Committee**
Dr. Eric Roth (Department of Anthropology)
**Supervisor**
Dr. Andrea Walsh (Department of Anthropology)
**Departmental Member**

The illegal drug *ecstasy*, chemically known as 3,4-methylenedioxymethamphetamine (MDMA), sometimes contains additional chemicals which can pose health risks to users. This thesis examines strategies that recreational ecstasy users in Victoria, British Columbia utilize to determine the purity of their ecstasy. It also examines why they use these strategies and if they are concerned about impure ecstasy affecting their health because this information can help explain the use of these strategies. I performed a quantitative analysis of data collected by the Centre for Addictions Research of BC's survey, the *Canadian Recreational Drug Use Survey,* to determine the strategies participants utilized to minimize potential harms caused by ecstasy use. This analysis revealed that 73.9% of survey participants discussed purity of ecstasy with friends, 33.3% checked drug information websites, 17.4% used an ecstasy testing kit, 2.9% asked harm reduction services for advice, and 0% owned a testing kit. In addition, the data revealed that the participants were more likely to take ecstasy from a friend than a stranger. Next, I developed an interview guide based on these findings and I interviewed 10 female recreational ecstasy users. I chose to interview women only because recreational drug use by women is underrepresented in the drug literature. The most common strategy the women utilized to determine ecstasy purity was to discuss ecstasy with friends. They preferred this strategy because it was a convenient, practical strategy. Also, they perceived their friends to be a trusted source of ecstasy and ecstasy information. Half the women analyzed how they felt after ingesting ecstasy to determine its purity because they believed different chemicals caused different effects. Others assessed the physical characteristics of their ecstasy to try to determine purity because they believed these characteristics could reveal its chemical contents. One participant used an ecstasy testing kit, but the rest cited multiple barriers to their use. Some women also had negative attitudes towards testing kits and felt no social pressure to use them. I asked the participants about their use of ecstasy testing laboratories, but none used this service because they did not know it existed. Overall, none of the women seemed concerned about ecstasy impurity harms. This could be due

to four factors. First, their ecstasy use patterns made them feel safe from harms related to ecstasy use. Second, recreational ecstasy use was “normal” amongst young adults in Victoria who attend parties, raves, or clubs. Third, they primarily obtained ecstasy and ecstasy information from trusted friends. Fourth, they had never suffered significant harm caused by ecstasy impurity, even though all of the women believed they had ingested impure ecstasy.

## Table of Contents


Supervisory Committee ..... ii
Abstract ..... iii
Table of Contents ..... v
List of Tables ..... vi
List of Figures ..... vii
Acknowledgements ..... viii
Chapter 1: Introduction ..... 1
1.1 Statement of Problem and Research Questions ..... 1
1.2 Literature Review ..... 3
1.3 Conceptual Framework ..... 17
Chapter 2: Materials and Methods ..... 24
2.1 Quantitative Data ..... 24
2.2 Qualitative Data ..... 28
Chapter 3: Results ..... 37
3.1 Sample Descriptive Statistics ..... 37
3.2 Quantitative Results ..... 37
3.3 Interview Results ..... 38
Chapter 4: Discussion and Summary ..... 74
4.1 Summary of Results ..... 74
4.2 Limitations ..... 82
4.3 Implications ..... 86
4.4 Recommendations and Future Research ..... 89
Chapter 5: Conclusion ..... 92
Works Cited ..... 96
Appendix 1: Recruitment Poster ..... 107
Appendix 2: Email Script ..... 108
Appendix 3: Consent Form ..... 109
Appendix 4: Interview Guide ..... 112

## List of Tables

Table 1: Examples of Drugs Detected by a Marquis Reagent® Testing Kit and the Colour Responses. Data from Moffatt et al. 1986 (Winstock et al. 2001) ..... 15
Table 2: Descriptive Statistics of Interview Participants ..... 37

## List of Figures

Figure 1: Theory of Planned Behaviour Model ..... 23
Figure 2: Sources of Ecstasy during the Past 12 Months, CRDUS Data 2012 ..... 27
Figure 3: Steps to Minimize Risk of Harm from Ecstasy, CRDUS Data 2012 ..... 27
Figure 4: Social Groups Diagram ..... 31

**Acknowledgements**

Thank you to Dr. Eric Roth for his tremendous help, encouragement, and valuable feedback during all stages of my project. I would also like to extend thanks to Dr. Andrea Walsh for being part of my supervisory committee and to Dr. Tim Stockwell for being my external examiner. Thank you to the faculty and staff in the department of Anthropology for your assistance and encouragement. Thank you to my friends in the program, particularly Thea, Kristianne, Emma, and Ursula, for making my grad school experience positive and memorable. Thank you to my parents and brother who have always believed I can accomplish great things and who have supported me from the beginning. Finally, I would like to thank Ronald for his words of encouragement; he gave me the strength to persist and finish my thesis.

# Chapter 1: Introduction

This thesis is structured into five chapters. This chapter outlines the research problem, research questions, relevant literature, and the conceptual framework used for my research project. Chapter Two presents the methodology for this thesis. Chapter Three explains the results of my analysis. Chapter Four discusses and summarizes the results, including their limitations and implications. Chapter Five outlines my conclusions.

## 1.1 Statement of Problem and Research Questions

To date, millions of people around the world have used the illicit drug *ecstasy*, chemically known as 3,4-methylenedioxymethamphetamine (MDMA) (Cowan et al. 2008). Ecstasy literature describes the drug as a global phenomenon amongst youth (Agar and Reisinger 2003; Hunt et al. 2011; Olsen 2009). In North America, ecstasy is one of the most common drugs that people use recreationally (Pentney 2001), and in Canada specifically, studies show high levels of use (UNODC 2014a). A serious problem associated with ecstasy use is ecstasy impurity; pills or powders that people claim to be "ecstasy" may contain chemicals besides MDMA, and these chemicals can be highly toxic (Canadian Centre on Substance Abuse 2015; Health Canada 2015b). For this reason, "Users of ecstasy are involved in a form of lottery with no guarantee that the tablets they purchase will contain MDMA" (Sherlock et al. 1999:197). This is problematic because when ecstasy users knowingly or unknowingly ingest impure ecstasy they can experience severe health problems, including death (for example, see Becker et al. 2003; EMCDDA 2003; Vevelstad et al. 2012). For instance, in late 2011 and early 2012, 20 individuals in Alberta and seven individuals in British Columbia died after ingesting ecstasy that contained a stimulant drug called paramethoxymethamphetamine (PMMA). While PMMA is structurally similar to MDMA, it is considerably more toxic (Nicol et al. 2015).

In recognition of this problem, this thesis examines strategies that ecstasy users utilize to determine ecstasy purity, and the reasons users choose these strategies, focusing on three strategies: discussing purity with friends, using laboratory pill testing services, and using an ecstasy testing kit. This thesis also analyzes if ecstasy users are concerned about impure ecstasy affecting their health.

Studies reveal that friends are frequently the primary source of information on ecstasy, including its purity (for example, see Jacinto et al. 2008; Johnston et al. 2006). Unfortunately, this information could potentially be inaccurate because individual opinions and experiences are subjective (Johnston et al. 2006). Alternatively, there are technologies that can help ecstasy users identify impure ecstasy and potentially prevent harms caused by impurities, such as laboratory testing services and ecstasy testing kits; however, many ecstasy users do not utilize these strategies (Allot and Redman 2006; Johnston et al. 2006). Researchers have argued that future drug research should examine the determinants of ecstasy testing because there is a lack of information on why individuals decide to use or not use this and other harm reduction strategies (Peters et al. 2007:115).

In addition, in drug use studies, there is a lack of information and a dearth of personal stories regarding women's recreational drug use (Ettorre 1992, 2004, 2007; Hinchliff 2001; South and Teeman 1999), which has resulted in a "gender imbalance" in the drug literature (Hinchliff 2001:455). Previous female substance user studies focused mainly on women pursuing treatment or other forms of help for substance use, ignoring female substance users outside a clinical setting (Ettorre 1992:2). This was the case particularly prior to the 1990s when studies of female drug users focused on problematic and dependent drug use instead of other types of use, such as recreational (Measham 2002:343-5). Considering the paucity of information regarding women's drug use and ecstasy testing, in this thesis I examine strategies that female ecstasy users in

Victoria, British Columbia utilize to determine the purity of their ecstasy, including their use of ecstasy testing services and kits.

Using statistical analysis and semi-structured interviews with ten female recreational ecstasy users, I examined three research questions: First, *do ecstasy users think impure ecstasy poses a risk to their health? Why or why not?* Second, *what strategies do ecstasy users utilize to determine the purity of their ecstasy?* (e.g. testing kits, laboratory services). Third, *why do ecstasy users choose these strategies*? (e.g. ease of access).

## 1.2 Literature Review

Ecstasy and Its Effects

Ecstasy, also called *M* or *E,* is a synthetic drug chemically related to amphetamine and mescaline that has stimulant and hallucinogenic properties (Kalant 2001; Smith et al. 2002). While users can snort or inject ecstasy, most consume it orally in the form of pills or powder. Ecstasy increases the release of neurotransmitters and generally causes feelings of euphoria and intimacy, increased energy, and changes to visual perception (Smith et al. 2002). It is an entactogen, meaning it gives the user "feelings of love and warmth" (Parrott 2014:37), and its empathogenic qualities frequently result in social bonding between ecstasy users (Jacinto et al. 2008). However, ecstasy purity, dose, ambient temperature, level of hydration, and amount of physical activity while under the influence of ecstasy influence the effects that an individual experiences (Kolbrich et al. 2008; Parrott 2006; Parrott et al. 2006).

Most ecstasy users who consume recreational doses of pure ecstasy experience desirable effects, such as euphoria and enactogenic feelings, but sometimes they report adverse or undesirable effects, such as nausea, headaches, and agitation (Brunt et al. 2012). In addition, common short-term negative effects include anxiety, tachycardia, and hypertension. More serious

short-term health problems can include arrhythmias and hyperthermia (Smith et al. 2002), high concentrations of potassium in the blood (hyperkalemia) (Raviña et al. 2004), low concentrations of sodium in the blood (hyponatraemia), seizures, and psychiatric disorders (Burgess et al. 2000). Ecstasy use has also been associated with liver toxicity (Antolino-Lobo et al. 2011; Burgess et al. 2000), very high fever (hyperpyrexia), and organ failure (Hall and Henry 2006). Furthermore, recreational ecstasy use can potentially cause long-term negative health problems, such as problems with memory, brain functioning, and problem-solving skills (Parrott 2013).

Studies suggest that serious health problems caused by ecstasy use are relatively rare; however, when complications do occur, they can be unpredictable and fatal (for example, see Growing et al. 2002; Hall and Henry 2006). For example, ecstasy users who develop hyperkalemia, hyponatraemia, hyperthermia, or another serious health problem might die because of these complications (Green et al. 2003; Hartung et al. 2002; Raviña et al. 2004). Life-threatening problems have also been linked to the interaction of ecstasy with other drugs that individuals simultaneously consume (Antolino-Lobo et al. 2011). Schifano (2004) argues that in many cases it can be difficult to understand the role ecstasy plays in "ecstasy-related deaths" because of polydrug use. In addition, he asserts that the variability of ecstasy purity can make it difficult to interpret ecstasy's role in fatalities as opposed to the role of other substances in "ecstasy" pills or powders. This is also true for non-fatal negative experiences. For instance, a study linking the adverse effects experienced by ecstasy users with the contents of their ecstasy suggested the presence of chemicals besides MDMA was responsible for the majority of the adverse effects, such as hyperthermic seizures and heart palpitations (Brunt et al. 2012).

Setting

People refer to ecstasy as a *party* or *club drug*, a term that describes drugs usually ingested at raves, dance clubs, or bars (Levinthal 2008:22). Beginning in the 1980s, ecstasy became popular at raves: nightlong dance parties usually in secret locations where disc jockeys (DJs) play electronic music. Raves first appeared in the United States and Britain in the mid-1980s before spreading to other countries, such as Australia and Canada (Weir 2000). Currently, ecstasy is associated with raves globally (Hunt et al. 2001). For example, in Canada, ecstasy is still strongly associated with raves and it has been cited as the "the most notorious rave drug" (Weir 2000:1844). Considering its association with raves and other dance events, Smirnov and colleagues believe there is a "recognized nexus between ecstasy use and dance culture" (2013:430).

In addition to its use at music events, ecstasy is used in a variety of other social settings. For instance, Schensul and colleagues (2005) explain that ecstasy use has moved from settings associated with dance events, such as clubs and raves, to urban neighbourhoods and "youth networks." Currently, ecstasy is also commonly consumed in private residences, usually amongst a group of friends (Bahora et al. 2009; Boeri et al. 2004).

## Prevalence of Ecstasy Use in Canada

In Canada, ecstasy use is popular, especially amongst young people. In 2013, researchers collected data that show 4.1% of Canadians aged 15 years and older have used ecstasy in their lifetime. The data also reveal that the use of ecstasy during lifetime is highest amongst individuals aged 20 to 24 years old (about 9.5%), followed by individuals 15 to 19 years old (around 4.5%) (Health Canada 2015a). This translates to over one million young Canadians who have tried ecstasy.

Furthermore, Zhao and colleagues' (2014) analysis of data collected by the Canadian Alcohol and Drug Use Monitoring Survey (CADUMS) in 2009 to 2012 shows that the prevalence of lifetime ecstasy use is significantly higher in British Columbia compared to other Canadian provinces. They found this statistically significant difference in prevalence of ecstasy use for each year of study. For instance, in 2012, about 6.3% of individuals 15 years and older in British Columbia had used ecstasy during their lifetime compared to 4.1% of individuals in other provinces.

Locally, in Victoria, researchers at the Centre for Addictions Research of British Columbia (CARBC) collect data on adults who recreationally use drugs in social settings by administering the *Canadian Recreational Drug Use Survey* (CRDUS). Overall, this "high risk" population reports higher illicit substance use than the general population (Tanner et al. 2014:18). Between 2008 and 2014, researchers at CARBC interviewed 639 recreational drug users in Victoria who attend clubs, raves, or parties, and found that 63% of the participants had used ecstasy during the last 30 days (CARBC 2015b). In 2014, 69% of participants reported using ecstasy during the last 30 days. For both time periods, more participants reported using ecstasy during the past 30 days than any other drug besides alcohol, cannabis, and tobacco (CARBC 2015b).

## History

While MDMA has become a popular recreational drug nicknamed "ecstasy," researchers created it for alternative purposes. In 1912, Dr. Anton Köllisch synthesized this drug at a German pharmaceutical company, Merck (Freudenmann et al. 2006). While the ecstasy literature often proposes that MDMA was purposely synthesized as an appetite suppressant (for example, see Henry et al. 1992; Kalant 2001; O'Leary et al. 2001), an analysis of the original documents in Merck's archives in Darmstadt, Germany reveal it was created as an intermediate chemical while

chemists were synthesizing a haemostatic substance. Merck inadvertently patented MDMA, along with other intermediate chemicals, when the company obtained a procedure patent for the haemostatic substance. During the following decades, researchers decided to test MDMA and its effects, eventually conducting formal studies on animals in the 1950s and studies on humans in the 1960s (Freudenmann et al. 2006).

In the 1970s, a pharmacologist and chemist named Alexander Shulgin learned about MDMA's psychoactive effects on humans. Shulgin synthesized the drug and gave it to psychologist Dr. Leo Zeff who used it during psychotherapy sessions and also introduced it to other psychotherapsists (Benzenhofer and Passie 2010). Some psychiatrists continued to use MDMA as a psychotherapeutic drug for its ability to increase patient empathy until the Drug Enforcement Administration (DEA) made the possession of it illegal.

## Legality

The DEA classified ecstasy as a Schedule I drug in the United States in 1985 under the Controlled Substances Act (Gwinnell and Adamec 2008; Levinthal 2008; Smith et al. 2002). This act defines Schedule I drugs as having no accepted medical use, a high possibility for abuse, and possible physical or psychological dependence (Department of Justice 2014). Similarly, in Canada, MDMA is a Schedule I drug under the Canadian Controlled Drugs and Substances Act (CDSA) (Canadian Centre on Substance Abuse 2015). According to this act, it is illegal to possess, traffic, and manufacture ecstasy (Minister of Justice 2015). Since ecstasy is illegal, it is a black market drug that is produced primarily in clandestine laboratories (Canadian Centre on Substance Abuse 2015; Gallagher et al. 2012).

Ecstasy Purity

Since the manufacturing of ecstasy is illegal and unregulated, the composition of ecstasy can vary widely in regards to the types and amounts of chemicals it contains. "Ecstasy" might contain MDMA mixed with other chemicals or no MDMA at all (Canadian Centre on Substance Abuse 2015; Health Canada 2015b**).** In Canada, since ecstasy use is prevalent, but MDMA production and MDMA seizures have decreased, this suggests that ecstasy producers are using substances besides MDMA to manufacture ecstasy (UNODC 2014a:49). Some substances have similar effects as MDMA, such as methylenedioxyethylamphetamine (MDEA), so ecstasy users might erroneously think they have ingested MDMA (Brunt et al. 2012). Some chemicals may not cause harm, but others can be highly toxic and hazardous to the user's health, such as PMMA, also known as "Death" (Vevelstad et al. 2012). For this reason, ecstasy users are always at risk of ingesting life-threatening substances (Becker et al. 2003).

The inclusion of other chemicals in ecstasy occurs for a few reasons. Firstly, the methods and materials that a producer uses to manufacture ecstasy affect the contents of ecstasy. Ecstasy is a "synthetic drug" created in a laboratory using precursor chemicals usually used to produce industrial and household products (Tanner et al. 2014). When producers make ecstasy, their skills, available resources, and methods affect the quality of the drug (Cole et al. 2015:4). Producers manufacture ecstasy using a variety of methods, reagents, and precursor chemicals, which can result in numerous contaminants (Kochana et al. 2006; Stojanovska 2013; Swist et al. 2005). *Contaminants* refer to the "by-products of the manufacturing process" (Cole et al. 2010:3); however, producers, along with their environment, can unintentionally contaminate ecstasy during many stages of production, including packing and storing (Cole et al. 2010; Swist et al. 2005).

Secondly, the availability of precursor chemicals used to manufacture MDMA affects the purity of ecstasy. For decades, law enforcement authorities around the world have been using international controls and legal provisions to limit access to precursor chemicals used to manufacture ecstasy, resulting in many seizures of these chemicals during shipment and in clandestine laboratories (UNODC 2014b). For example, during 2002 to 2012, authorities seized about 16 tons of ecstasy precursors globally per year (UNODC 2014b:79). Controls and legal provisions of precursor chemicals means it is more difficult for producers to manufacture MDMA, so it is less available for use in the manufacturing of ecstasy (UNODC 2014b). Therefore, drugs sold as "ecstasy" sometimes contain less MDMA due to decreased availability of precursor chemicals (UNODC 2012:4), at least until ecstasy producers discover a non-controlled substitute precursor chemical to use (UNODC 2014b). Alternatively, some producers make precursors themselves, which adds "another unknown element" into the drug (Cole et al. 2010:4), potentially resulting in impure ecstasy.

Thirdly, some ecstasy producers purposefully add chemicals to make ecstasy cheaper or easier to manufacture. These include pharmacologically inactive chemicals called *diluents*, also known as *cutting agents*, and active chemicals called *adulterants.* Cutting agents include "inert substances that are added solely to increase product bulk" (Stojanovska et al. 2013:23), and, as a result, they decrease the amount of the active ingredients in a drug (Cole et al. 2010:3). For example, some drug producers add legal, easily accessible substances, such as cornstarch, to reduce the cost of manufacturing ecstasy (Health Canada 2015b). While cutting agents usually do not harm users, adulterants can cause serious health problems.

Adulterants are pharmacologically active ingredients that some drug producers add to ecstasy to create "synergistic or antagonistic effects" (Cole et al. 2010:3), or they substitute MDMA with adulterants that have similar effects as MDMA (Health Canada 2015b). Since substances, such as

caffeine and the cough suppressant called dextromethorphan, cause similar effects as MDMA but are cheaper and easier to access, some producers choose to add these substances to ecstasy in combination with or in substitution of MDMA (Cut et al. 2010).

By adding adulterants, producers are putting ecstasy users at risk. "The variation in substances used to adulterate illicit drugs contributes to the unpredictability of the drug's effects" (Cole et al. 2010:4). The interaction of ecstasy with other chemicals can have toxic effects, possibly leading to negative health consequences (Antolino-Lobo et al. 2011; Pentney 2001; Schifano 2004; Verschraagen et al. 2007). For example, ecstasy sometimes contains amphetamines (Hayner 2002; Sherlock et al. 1999). While the effects of combining ecstasy with other amphetamine-type substances are still largely unknown, "…the present work clearly demonstrates that potentially harmful interactions among amphetaminic drugs are expected when these drugs are taken concomitantly" (Dias da Silva et al. 2013:112). Amphetamines are only one of several adulterants that some producers add to ecstasy.

Several studies highlight impurities found in ecstasy. For example, a chemical analysis of 107 ecstasy pills provided by individuals in the United States revealed that only 63% contained some MDMA or an analogue (MDEA or methylenedioxyamphetamine (MDA)), 29% contained identifiable drugs but no MDMA or analogues, and 8% contained no identifiable drugs (Baggott et al. 2000). Similarly, in an analysis of 25 ecstasy tablets in the United Kingdom, 12 tablets contained MDMA, four contained MDEA, and nine contained other substances only, such as caffeine and an anesthetic called ketamine (Sherlock et al. 1999). In addition, an Australian study by Camilleri and Caldicott (2005) of ecstasy pills collected at a rave and by the police over a six-month period revealed that 68% of the pills collected at the rave and 89% of pills seized by the police contained MDMA; however, some of the pills contains other drugs as well. For example, 27% of the ecstasy collected at the rave and 26% of the ecstasy seized contained ketamine.

Some chemicals that authorities have found in ecstasy are highly toxic, such as PMMA. This substance is occasionally found in drugs sold as ecstasy and is more toxic than MDMA (Becker et al. 2003; Nicol et al. 2015; Vevelstad et al. 2012). After an individual consumes ecstasy, they generally expect the effects to begin after a certain time length, and if they do not occur, an individual may take more of the substance because they think they have ingested a "weak" pill (Winstock et al. 2001). Since the stimulant and hallucinogenic effects of PMMA take longer to occur than those of MDMA, some users might choose to consume additional pills, causing individuals to consume large, dangerous amounts of PMMA. Studies suggest that doses of about 50 mg of PMMA can lead to life-threatening increase in body temperature and blood pressure (Becker et al. 2003). There have been multiple deaths associated with individuals ingesting ecstasy that contained PMMA globally, including in Canada, USA, Australia, and Europe (Becker et al. 2003; EMCDDA 2003; Nicol et al. 2015; Vevelstad et al. 2012).

Ecstasy Testing

Considering substances other than MDMA can be found in ecstasy powder and pills, some users test their ecstasy to analyze its chemical composition. Individuals can use do-it-yourself colour reagent testing kits, such as the Marquis Reagent® Testing Kit. To use a colour reagent testing kit, an individual applies a reagent containing sulphuric acid and formaldehyde to ecstasy and a chemical reaction will produce a colour. The colour can be compared to a colour chart that shows colours produced by a variety of drugs, such as MDMA, ketamine, and amphetamines (Winstock et al. 2001).

Studies show that using ecstasy testing kits is not a common practice. In an Australian study, only 22% of participants reported that they use a testing kit to test the chemical composition of their ecstasy before consumption; however, about two thirds of the participants

claimed that they would use testing kits if they were more available (Johnston et al. 2006). In a study by Allott and Redman (2006), about 40% of their sample in Australia had used a testing kit at least once. Similarly, in a study in the Netherlands, 47% of ecstasy users had experience testing their ecstasy; however only 23% of the participants reported that they often or always did so (Van de Wijngaart et al. 1999). Overall, these studies suggest that the majority of ecstasy users do not test their ecstasy before they consume it.

In contrast, researchers at the harm reduction organization, ANKORS, surveyed 182 attendees of the Shambhala Music Festival in British Columbia in 2013 who had accessed their services, which included pill and powder testing, harm reduction information, and harm reduction supplies. The researchers found that 81% of the individuals had experience using the testing service provided by ANKORS at the festival. However, it is important to note that only individuals who had used ANKORS services were eligible for the study, and individuals using the testing service can test any type of pill or powder, not just ecstasy (Dowden and Michelow 2015). This suggests that these findings are not representative of the prevalence of ecstasy testing by ecstasy users at the festival; the prevalence is probably considerably lower. Overall, the prevalence of ecstasy testing might vary based on the availability of home testing kits and testing programs, and the legality of ecstasy testing in each country (Johnston et al. 2006).

While ecstasy testing kits can help protect users from impure ecstasy, they are imperfect. Winstock and colleagues (2001) argue that there are several problems with this type of ecstasy testing. First, different substances can produce the same or similar colours and interpreting the colour is subjective. For example, if MDMA is present in an ecstasy sample, the reagent will produce a violet-purple to blue-black colour; however, other substances can produce these colours as well (see Table 1). Second, these testing kits do not detect all potentially dangerous chemicals found in ecstasy, such as the synthetic drug 4-Methylthioamphetamine (4-MTA).

Third, a testing kit may show that MDMA is present in the pill but the dark colour produced by the chemical reaction can hide other colours produced by the presence of other potentially harmful substances. Colour reagent testing kits can often inform ecstasy users if their pill or powder contains ecstasy-like substances (i.e. MDMA, MDA, MDEA), but its subjectivity and lack of accuracy in identifying other potentially harmful substances can be problematic (Camilleri and Caldicott 2005).

Ecstasy testing kits are "rudimentary" because they test for the presence of various chemicals, but they cannot quantify the purity or dosage of the pill or powder (Dowden and Michelow 2015:12). For these reasons, Winstock and colleagues (2001) believe colour reagent test kits, like the Marquis Reagent® Testing Kit, are potentially harmful for ecstasy users because the kits cannot reveal the exact chemical composition of ecstasy, but individuals may believe the test results show the ecstasy is pure or good quality. However, using an ecstasy testing kit can reveal if a pill or powder contains *no* MDMA; therefore, it can help protect users from consuming impure ecstasy as long as they are cognizant of the testing kit's limitations.

Alternatively, ecstasy users can test their ecstasy using laboratory tests. Laboratories use chromatographic equipment, such as high performance liquid chromatography (HPLC) and gas chromatography-mass spectrometry (GC-MS), to analyze the chemical composition of ecstasy powders and pills. Erowid Centre (2012) is an example of an organization that supports ecstasy testing in a laboratory. It operates an independent laboratory pill-testing program called the Ecstasy Data program. According to Ecstasy Data (2013), this program collects and shares lab-testing results from multiple organizations and also performs its own tests at the Drug Detection Lab (DDL) in California, which is licensed by the DEA. Individuals can anonymously mail ecstasy samples to the laboratory at the cost of 40 dollars to test tablets and 100 dollars to test powder. The laboratory detects active chemicals and chemicals that GC-MS analysis can detect,

then Ecstasy Data posts the results of the analysis online (see https://www.ecstasydata.org/results.php), including a photo of the sample; a description; the relative amount of the detected substances; the date tested; the location of the sample; and a unique identification code, if the submitter attaches one to the sample.

Overall, ecstasy users utilize these techniques less frequently than colour reagent testing kits even though these laboratory tests provide more accurate results (Winstock et al. 2001). For example, Camilleri and Caldicott (2005) compared the chemical analyses of ecstasy collected at a rave in Australia and tested it using colour reagent tests and GC-MS analysis. The comparison revealed that the colour reagent test accurately reported the presence of an ecstasy-like substance or methylamphetamine in all the pills that contained these substances. However, it only accurately identified *all* substances present in ecstasy pills that contained a combination of drugs in 11% of the pills. The colour reagent test especially had trouble accurately identifying the presence of the drug ketamine. GC-MS analysis revealed that 22 of the ecstasy pills contained ketamine, but the colour reagent test only identified ketamine in four of the pills.

**Table 1: Examples of Drugs Detected by a Marquis Reagent® Testing Kit and the Colour Responses. Data from Moffatt et al. 1986 (Winstock et al. 2001)**

| Compound | Colour response to the Marquis test |
|---|---|
| Phenylephrine | Red |
| Fentanyl | Orange |
| Mescaline | Orange |
| Pethadine | Orange |
| Phenethylamine | Orange |
| Phentermine | Orange |
| Psilocybin | Orange |
| Trimethoxyamphetamine | Orange |
| Amitriptyline | Brown-Orange |
| Chlordiazepoxide | Yellow |
| Cyclizine | Yellow |
| DOM | Yellow |
| Lorazepam | Yellow |
| Amphetamine | Yellow-Orange → brown |
| Dexamphetamine | Yellow-Orange → brown |
| Methylamphetamine | Yellow-Orange → brown |
| 2,5-dimethoxy-4-methamphetamine (STP) | Yellow → Green |
| 2-CB | Yellow → Green |
| Diphenhydramine | Yellow → Green |
| DOB (2,5-dimethoxy-4-bromo-amphetamine) | Yellow → Blue-green |
| Verapamil | Yellow → Grey |
| Buprenorphine | Violet |
| Chlorpromazine | Violet |
| Codeine | Violet |
| Diamorphine | Violet |
| Dihydrocodeine | Violet |
| Morphine | Violet |
| MDMA | Violet-Purple → Blue-Black |
| MDEA | Violet-Purple → Blue-Black |
| MDA | Blue-black (sulphuric acid alone—violet) |
| Thioridazine | Violet-red → Blue-green |

Friends

The common practice of sharing drugs between friends makes drugs, like ecstasy, more accessible and available in some peer groups (Parker et al. 2002). In addition to sharing ecstasy, friends also share information about ecstasy with each other, including effects, risks, and strategies to minimize risks, and this information often flows from experienced users to new users (Hansen et al. 2001). Since individuals make decisions within a social context, they are able to exchange and evaluate information, learn about the flexibility of social norms, and influence each other's behaviours and attitudes (Kohler et al. 2007).

Several studies show that ecstasy users believe their peer group is the primary and most accurate source of information on ecstasy (Jacinto et al. 2008; Johnston et al. 2006; Murphy et al. 2006; Russel et al. 2004). For example, Jacinto and colleagues (2008) argue that since ecstasy use tends to be a social event, information on how to maximize pleasurable effects and minimize

potential harms is often shared between friends. In general, the participants in their study believed the information about ecstasy they receive from their friends is "one of the most trusted resources of ecstasy information" (2008:395). Similarly, Murphy and colleagues (2006) report that 67% of participants in their study used their friends as a source of information about ecstasy and its effects; this proportion was at least twice as large as any of the other sources from which individuals obtained ecstasy information, including nightclubs, newspapers, magazines, television news and programs, drug agencies, and drug leaflets. They also found that females were more likely to use their friends as a source of information about ecstasy than males.

In regards to ecstasy purity, the results are congruent. Johnston and colleagues (2006) found that individual's friends are the most important source of information on the contents of ecstasy. In their study, over two-thirds of participants who had attempted to discover the contents of their ecstasy before ingestion, asked their friends who had previously consumed it about its contents. While this is an example of sharing experiential knowledge, some individuals in their sample also reported that their friends used testing kits and would test a pill in each "batch of ecstasy" and share this information (Johnston et al. 2006:468). Similarly, a survey conducted by ANKORS at the Shambhala Music Festival showed about 85% of the individuals who accessed the pill and powder testing service at the festival used this service to gather information on the drug's content either for other people only, or for themselves and other people (Dowden and Michelow 2015:13). This shows that the majority of participants planned to share this information with others. However, even if individuals consume ecstasy pills that look the same or are from the same "batch," this does not guarantee the pills will have the same chemical composition (Sherlock et al. 1999; Winstock et al. 2001).

One reason for the emphasis on friends in regards to ecstasy information is *trust*. Lupton and Tulloch explain, "There is a symbiotic relationship between trust and risk, for trust serves to

minimize the dangers to which particular types of activity are subjected" (1998:27-28). The link between ecstasy, friendship, and trust also extends beyond obtaining information to obtaining the drug itself. For instance, individuals purchase ecstasy based primarily on friendships and trust instead of on the brand or type of the ecstasy (Duterte et al. 2009).

However, it is important to note that information obtained from friends is not necessarily accurate. While drug users often assume that drugs provided by friends or acquaintances means the drugs will be good quality (Parker et al. 2002), ecstasy users who gather information on pill or powder content may receive inaccurate information from friends because individual opinions and experiences are subjective (Johnston et al. 2006:470). For example, Measham and colleagues (2011) explain that although most of the female drug users they interviewed asked their drug-using friends for information and advice on drugs, some of the participants still reported negative experiences involving taking too many drugs or taking drugs that had adverse effects. This is concerning since friends tend to be the primary source of information on ecstasy purity.

### 1.3 Conceptual Framework

I use two theoretical concepts and a model to provide a framework for my project. First, I use the concept of *risk perceptions* (Douglas 1992) to understand how ecstasy users perceive ecstasy and its contents and why they choose particular strategies to determine ecstasy purity. Second, I use the concept of *normalization* (Parker 2004; Parker et al. 2002) to understand how it connects to individuals' risk perceptions of impure ecstasy and the strategies that they use to determine the contents of their ecstasy. Finally, I use a model called *Theory of Planned Behaviour* (Ajzen 2008; Ajzen and Albarracin 2007) to help explain the use of ecstasy testing kits amongst my participants.

Risk Perceptions

*Risk perceptions*, which influence individuals' choices and actions, refer to people's "subjective impression of riskiness" (Weber 2009:3). According to Mary Douglas (1992), people's perceptions of risks are socially constructed and rooted in cultural factors. People *create* risk perceptions and rules to manage their knowledge of risk from personal observations and social experiences (Trostle 2005). In regards to illicit drugs, Hunt and colleagues (2007) argue that social context determines an individual's risk perceptions of drug use. In their study of 300 young dance event attendees in California, they found that the meanings and perceived risks of drug use were all socially-determined: "[The participants] conceptualize and experience risk and pleasure not solely as an atomized and individual response but as a socially embedded decision" (2007:87). This shows that social groups have an impact on an individual's risk perceptions of drug use, including ecstasy use.

There is disagreement regarding the level of risk that ecstasy users and young people in general perceive associated with ecstasy use. Many publications claim that people perceive ecstasy use to be "harmless" or "safe" (Bahora et al. 2009; Hurley et al. 2002; Smith et al. 2002; Wood and Synovitz: 2001). However, Gamma and colleagues (2005) believe the view that people generally perceive ecstasy use to be safe is false because ecstasy users are usually aware of many short- and long-term risks of ecstasy use. According to these authors, the view that people perceive ecstasy use to be safe is based on assumptions not supported by empirical evidence. Several studies support Gamma and colleagues' (2005) argument and reveal that users perceive ecstasy as a potential health risk (Murphy et al. 2006; Topp et al. 1999; White et al. 2006). For instance, Carlson and colleagues (2004) studied the perceived consequences that ecstasy users in Ohio, U.S.A. associate with ecstasy use. The researchers asked participants to identify ecstasy's location along a continuum that represented the amount of harm that drugs can potentially cause;

one end of the continuum represented drugs that are least "risky" and the other end represented drugs that are the most dangerous. Overall, participants classified ecstasy halfway in-between. In addition, most of the 29 participants reported at least one risk associated with ecstasy use, such as potentially consuming impure ecstasy.

Studies show that several ecstasy users perceive ecstasy use to be risky because pills can contain substances other than MDMA (Carlson et al. 2004; Hansen et al. 2001; White et al. 2006). For example, White and colleagues report that 90% of their 372 study participants perceived risks associated with ecstasy use, and the most commonly perceived risk was consuming "an illicit substance of unknown content" (2006:139). While most ecstasy users identify risks associated with ecstasy use, such as ecstasy impurity, these studies suggest that they do not perceive ecstasy use as a *high*-risk behaviour. A possible reason for this is that while individuals may identify a behaviour as "risky," if they do not personally experience a problem they often do not see this risk as significant (Gamma et al. 2005). Furthermore, individuals who perceive a high *prevalence* of ecstasy use in their social networks tend to view ecstasy use as a "normal" part of life and do not view it as a high-risk behaviour (Bahora et al. 2009; Parker et al. 2002; Parker 2004). This is an example of *normalization.*

Normalization

Some drug researchers apply the concept of *normalization* to help explain the practice and acceptance of "sensible" recreational use of certain illicit drugs by young people (Parker 2004; Parker et al. 2002). Parker and colleagues (2002) first applied this concept to drug use in the 1990s to explain the results of their longitudinal study of hundreds of "ordinary" young people in Britain, including drug users and abstainers. Specifically, they used their *normalization* thesis to understand why participants were knowledgeable about drugs, very likely to try drugs, why drug

use was equally prevalent amongst young women and men and across socio-economic profiles, and why participants were accepting of "sensible" recreational drug use, meaning they approved of certain amounts, frequencies, and types of drug use.

According to the researchers, in the context of illicit drug use, *normalization* has five factors that can indicate if a specific illicit drug has become normalized. First, the drug is easily accessible and available, meaning an individual can afford it and easily acquire it. Second, there is a high rate of trying by people of various socio-economic statuses and genders. This means individuals have tried the drug at least once during their lifetime. Third, there is a high rate of regularly using the drug, meaning individuals have tried the drug and routinely use it. Fourth, drug users and drug abstainers generally have an accommodating attitude towards "sensible" recreational drug use, meaning they accept and tolerate its use as part of reality. However, certain types of use do not qualify as "sensible," such as using a drug too frequently or being dependent on a drug. Fifth, there is cultural accommodation of drug use, which is evident in several ways, such as personal and political discussions of drug decriminalization and the inclusion and portrayal of drug use in movies, magazines, and music in a fairly neutral way instead of a deviant way (Parker 2004; Parker et al. 2002).

In regards to ecstasy use, Parker, Williams, and Aldridge (2002) believe that ecstasy use is moving towards normalization on each dimension in the United Kingdom, while in Canada, Cristiano (2014) argues that ecstasy use might be becoming normalized as well. Evidence for this is that individuals of various education and income levels have tried ecstasy in Canada. This shows that ecstasy trying is not limited to "deviant," lower-class individuals who have low education levels; in contrast, it is common across mainstream society in these aspects.

While the normalization thesis is "widely accepted" by researchers (Measham and Shiner 2009:502), there has been an ongoing debate regarding the usefulness of the concept of

*normalization* to help examine ecstasy use. Several researchers believe the normalization thesis can help assess if ecstasy use is, or is becoming, normalized in mainstream youth culture (Cristiano 2014; Duff 2005; Parker et al. 2002; Wilson et al. 2010) or even amongst adults (Measham, et al. 2011), but some researchers argue that it is not useful in making this assessment. For instance, Shiner and Newburn (1997) argue that the normalization thesis overestimates the amount of drug use amongst youth, does not fully consider the meaning of drug use for them, and does not capture the complexity of young people's choices.

Furthermore, some researchers believe the normalization thesis oversimplifies drug use amongst youth, so they believe normalization should only be considered in the context of a specific group or subculture, such as club attendees or ecstasy-using subcultures, not youth in general (Gourley 2004; Shildrick 2002; Shiner and Newburn 1997). Considering that drug use is simultaneously influenced by agency and structure, drug use and its potential normalization are best understood in the context of specific social groups because they operate in "bounded situations" (Measham and Shiner 2009:507). Overall, I think the concept of *normalization* can potentially increase the understanding of ecstasy use, as long as researchers consider the context of the group they are studying.

Theory of Planned Behaviour

For my thesis, I use the Theory of Planned Behaviour as a framework to analyze the use of ecstasy testing kits by female ecstasy users in Victoria. The Theory of Planned Behaviour, an extension of the Theory of Reasoned Action, is a model designed to explain, predict, and change human social behaviour, such as drug use (Ajzen 2008; Ajzen and Albarracin 2007). For this reason, I believe the model can help explain the drug-related behaviour of using ecstasy testing kits and identify potential barriers to their use (see Figure 1).

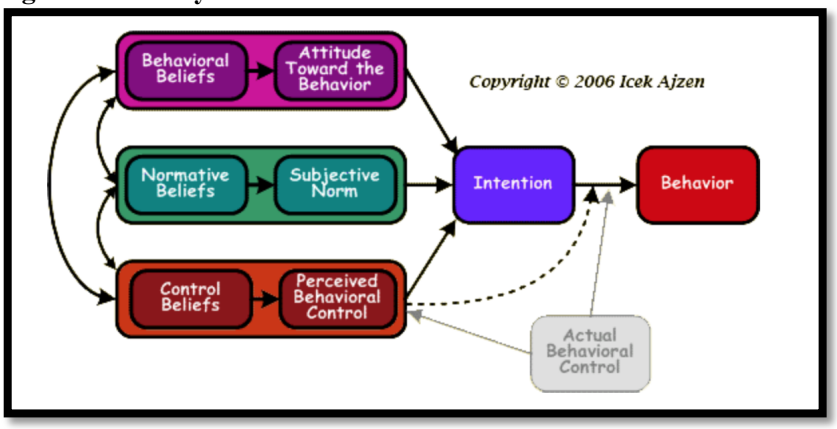
According to the model, an individual's behaviour is strongly determined by his or her intention to perform the behaviour, and an individual's intention can be predicted from three factors: his or her attitude towards the behaviour, subjective norms, and perceived behavioural control (Ajzen 1991; Ajzen 2008; Ajzen and Albarracin 2007). First, an individual's attitude towards the behaviour is a result of the person's beliefs about its potential consequences (Ajzen and Albarracin 2007:5), and a person's attitude might be positive or negative (McMillan and Conner 2003). Second, subjective norms are "the perceived social pressure to perform or not perform the behavior" (Ajzen and Albarracin 2007:5). This factor depends on if a person believes his or her reference group thinks he or she should perform the behavior and the person's motivation to adhere to these perceived expectations (McMillan and Conner 2003:163).

Third, perceived behavioural control is the "perceived capability of performing the behavior" (Ajzen and Albarracin 2007:5). In other words, it is an individual's perceptions regarding the level of difficulty in performing the behavior, which depends on his or her past experiences and the barriers he or she expects to encounter while performing the behavior (McMillan and Conner 2003:163). In general, an individual's intention to perform a behaviour will be stronger if the attitude, subjective norms, and perceived behavioural control are greater and more favourable (Ajzen 1991; Ajzen 2008; Ajzen and Albarracin 2007).

Furthermore, the theory states that the amount of actual behavioural control an individual has over the behaviour influences the effect that intention has on the behaviour: "Intentions are expected to result in corresponding behaviour to the extent that the individual has volitional control over performance of the behavior" (Ajzen 2008:1033). For example, if an individual experiences barriers or lacks necessary information or skills, then the individual might not be able to act on intention and, as a result, the person will not perform the behaviour (Ajzen 2012:445-446).

In the context of ecstasy use, studies show this model can help explain the determinants of intentions and use of ecstasy (Conner et al. 1998; McMillan and Conner 2003; Orbell et al. 2001; Peters et al. 2007). For example, in a study by Orbell and colleagues (2001), researchers found attitude and subjective norms provided a strong prediction of the participants' intentions to use ecstasy, a behaviour that they describe as "socially motivated" (2001:44). Furthermore, Peters and colleagues (2007) conducted a review of ecstasy literature and found intention and use of ecstasy were most strongly associated with attitudes, followed by subjective norms and perceived behavioural control. Notably, Peters and colleagues (2007) assert that there is a paucity of information about the determinants of harm reduction behaviours connected with ecstasy use. Thus, they believe future research should study behaviours beyond ecstasy use to include harm reduction practices, such as ecstasy testing. For this reason, I use the Theory of Planned Behaviour to examine the use of ecstasy testing kits amongst women in Victoria.

**Figure 1: Theory of Planned Behaviour Model**



## Chapter 2: Materials and Methods

For my study, I used a mixed methods approach combining qualitative and quantitative research methods (Hansen 2006; Padgett 2012). Padgett states, "The ecological validity of a quantitative study can be enhanced considerably by grounding the study in qualitative interviews and observation before or after" (2012:50). Similarly, Hansen argues that combining quantitative and qualitative research in a single project can result in a "detailed and comprehensive inquiry" (2006:11). For these reasons, I utilized a sequential mixed methods design (Padgett 2012), performing quantitative data analysis of cross-sectional survey data followed by semi-structured interviews. I analyzed survey data as a template for my interview guide questions, and the qualitative interview data enhanced my quantitative data analysis.

### 2.1 Quantitative Data

Survey Instrument

For the quantitative analysis, I used data collected in 2012 by the Centre for Addictions Research of BC's (CARBC) survey called the *Canadian Recreational Drug Use Survey* (CRDUS). This survey is used as part of CARBC's Alcohol and Other Drug (AOD) Monitoring Project to monitor drug use behaviours amongst club, rave, and party attendees (CARBC 2015a). The Research Ethics Boards at the University of Victoria, University of British Columbia, and Vancouver Coastal Health Authority approved this study. CRDUS asks questions about drug use, availability, price, perceptions of drug purity, beliefs regarding the harmful effects and risks of drug use, and socio-economic and health indicators. The survey focuses on nine specific drugs: ecstasy, cocaine, crack, crystal meth, LSD, heroin, mushrooms, GHB, and ketamine (CARBC 2015a; Duff et al. 2009). Through face-to-face interviews with trained

research assistants who record the responses, CRDUS has collected cross-sectional data on 40 to 50 drug users in Victoria twice per year since 2008.

Recruitment, Sample, and Eligibility

Participants are recruited using a combination of sampling methods, including word-of-mouth from participants who have already completed the survey and advertisements at coffee shops, bars, clubs, and university and college campuses. CRDUS participants must be 19 years of age or older, lived in Victoria for at least six months, used substances other than alcohol and tobacco on average at least once per month during each of the last six months prior to participation in the study, and be fluent in English. All participants receive a 20-dollar cash honorarium to pay for their time and travel expenses (CARBC 2015a). My sample consisted of 69 CRDUS participants ($n$=69) who reported in the survey that they had used ecstasy during the past 12 months.

Analytic Methods

I chose to analyze data collected during the two 2012 data collection periods because this was the most recently completed data set year available when I started my research in 2013. Using the Statistical Analysis System (SAS®, Version 9.3), I performed a univariate analysis with the SAS® PROC FREQ sub-routine to quantify participants' strategies to minimize potential harm from ecstasy use and to investigate participants' ecstasy sources. Specifically, I analyzed responses to the following questions: 1) *What, if any, steps do you take to minimize the potential harms associated with ecstasy?* Participants could choose multiple answers; possible answers included these: *Discuss purity of [ecstasy] with friends, check websites like Erowid.org or Pillreports.com, use a testing kit, own a testing kit, ask harm reduction services like Sanctuary*

*and Island Kids for advice,* and *none.* 2) *In the past 12 months, have you taken ecstasy from an unknown source (i.e. bought from a stranger at a club)?* 3) *In the past 12 months, have you taken ecstasy from a friend, even though the source was unknown (i.e. you don't know who your friend got it from, but they insist the source is reliable?)* Research assistants only asked these questions to participants who reported that they had used ecstasy in the past 12 months, which resulted in a total sample of 69 participants during 2012.

After my analysis of the quantitative data, I created two graphs depicting the results to these questions in order to prompt discussions with my interview participants that would offer an "explanation" for the results of my statistical data analysis (Bryman 2006:106). One graph represented ecstasy users' sources of ecstasy and whether individuals were more likely to get ecstasy from a friend or a stranger. This graph showed that about 45% of participants got ecstasy from an unknown source during the last year, such as a stranger at a bar, while around 62% of participants reported they got ecstasy from a friend even though they do not know where their friend got it (see Figure 2). The other graph represented the strategies ecstasy users utilized to minimize potential harms from ecstasy use. It illustrated that about 74% of participants reported that they discuss purity with friends, 33% check websites like Erowid.org, 17% use a testing kit, 3% access harm reduction services for advice, and 0% own a testing kit (see Figure 3).

**Figure 2: Sources of Ecstasy during the Past 12 Months, CRDUS Data 2012**

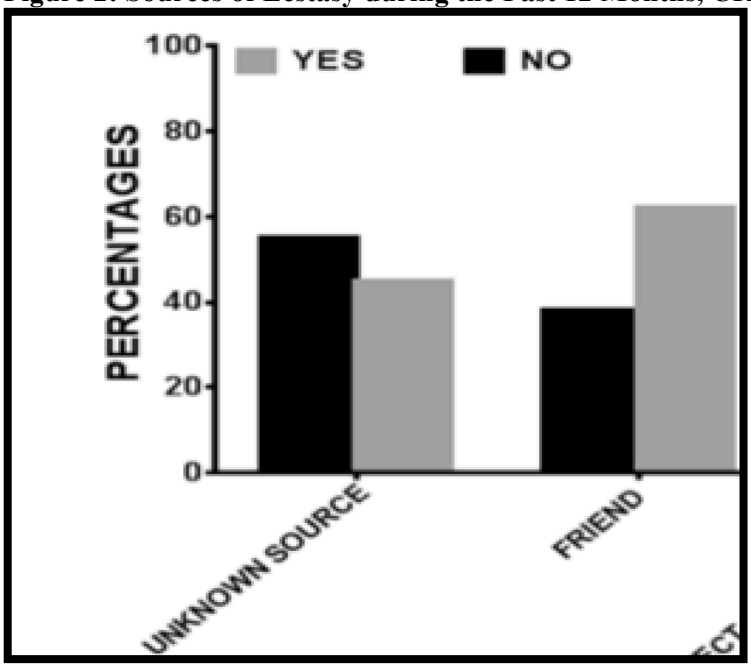
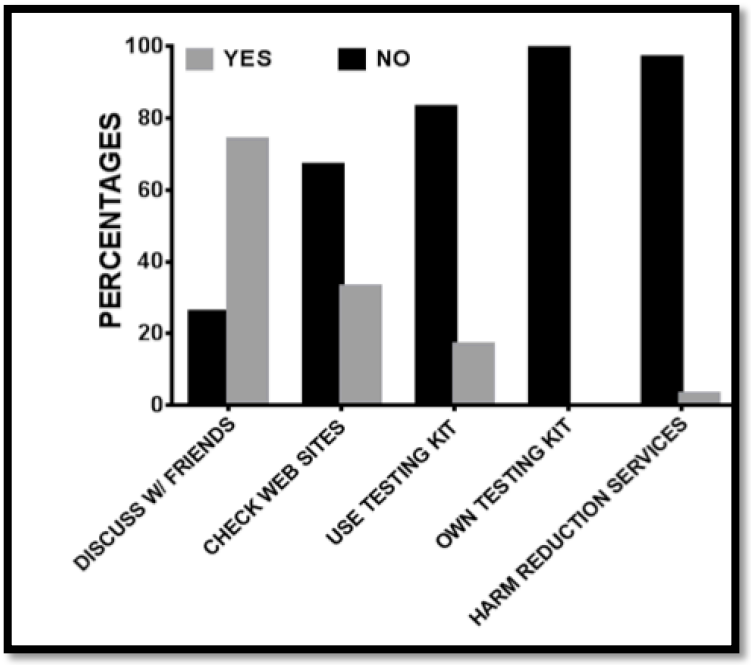



**Figure 3: Steps to Minimize Risk of Harm from Ecstasy, CRDUS Data 2012**



## 2.2 Qualitative Data

Sample and Eligibility

During 2015, I interviewed ten female recreational ecstasy users who live in Victoria, British Columbia. The participants met the following eligibility requirements: they were 19 years or older, identified as female, spoke and understood English, had lived in Victoria for a minimum of six months, and had experience using the drug ecstasy at least once per month during the past six months. Except for the criterion of using ecstasy and identifying as female, I utilized the same eligibility requirements in place for CRDUS participants. Similar to the CRDUS, my recruitment criteria were designed to "ensure the collection of timely and useful research data" (Duff et al. 2009:522). In addition, the methods, as well as the design, of the CRDUS were inspired by international drug monitoring systems utilized in other countries (Duff et al. 2009), so I aligned my study with these methods in regards to the eligibility criteria.

Recruitment of Participants

I recruited participants using *purposive sampling,* meaning I selected participants who I believed would provide me with data that would be useful for my project (Green and Thorogood 2009:118). I chose purposive sampling because this sampling method is cited as the most appropriate sampling method for selecting small samples from a "restricted population definition" (Battaglia 2008:525), such as female recreational ecstasy users who live in Victoria. To find participants who met my eligibility criteria, I placed advertisement posters on general notice bulletin boards at the University of Victoria and Camosun College Lansdowne Campus. The advertisement poster provided information on the study, including the eligibility requirements and my contact information (see Appendix 1 for Recruitment Poster). Individuals interested in participating in my study emailed me, and I responded with an email asking questions to ensure they were eligible (see Appendix 2 for Email Script). If the respondent met all of the eligibility

requirements, I provided her with details about the study and her participation in the study by emailing her a copy of the consent form (see Appendix 3 for Consent Form).

Interviews

I arranged to meet the participants on a day and time convenient for them. Between February 2, 2015 and March 24, 2015, I conducted ten interviews in private rooms located in either the McPherson Library or CARBC, both located on the University of Victoria campus. After each interview, I gave the participant an honorarium of 40 dollars cash. I chose this amount to reflect the time and possible inconvenience of participating in my study (Padgett 2012:87).

I performed a face-to-face semi-structured interview with each participant. In semi-structured interviews, the researcher plans what topics to cover, while the participants' answers guide what types of information will be discussed about each topic (Green and Thorogood 2009:94). According to Bernard (2011:157-8), this is the best type of interview to conduct when a researcher is interviewing participants only once because, while it is flexible and allows the interviewer to follow leads, the use of an interview guide allows the researcher to collect useful, comparable data.

For the interviews, I created an *interview guide*: a list of topics, questions, and prompts that I covered with participants (Bernard 2011:158). The interview guide directed our conversations, and it included these sections: descriptive statistics, history of ecstasy use, ecstasy and social groups, harms related to ecstasy use, ecstasy purity, ecstasy testing, and a discussion section (see Appendix 4 for Interview Guide). While I used this interview guide for each interview, I allowed participants to guide the conversation and discuss information that they were interested in discussing. Also, I asked additional questions throughout the interviews based on the participant's answers, ideas, and interests.

By using semi-structured interviews, I was able to create "a space for the interviewee to elaborate on their views and experiences related to the issue of inquiry" (Hansen 2006:100). As a result, the interviews allowed me to have in-depth conversations with the participants about their perceptions of and experiences with ecstasy and ecstasy purity, and to compare participants' experiences. The length of the interviews ranged between 35 minutes and 74 minutes with a mean length of 50 minutes. I audio recorded each interview with permission from the participants, and I wrote notes in my notebook when I thought of additional questions to ask during the interview.

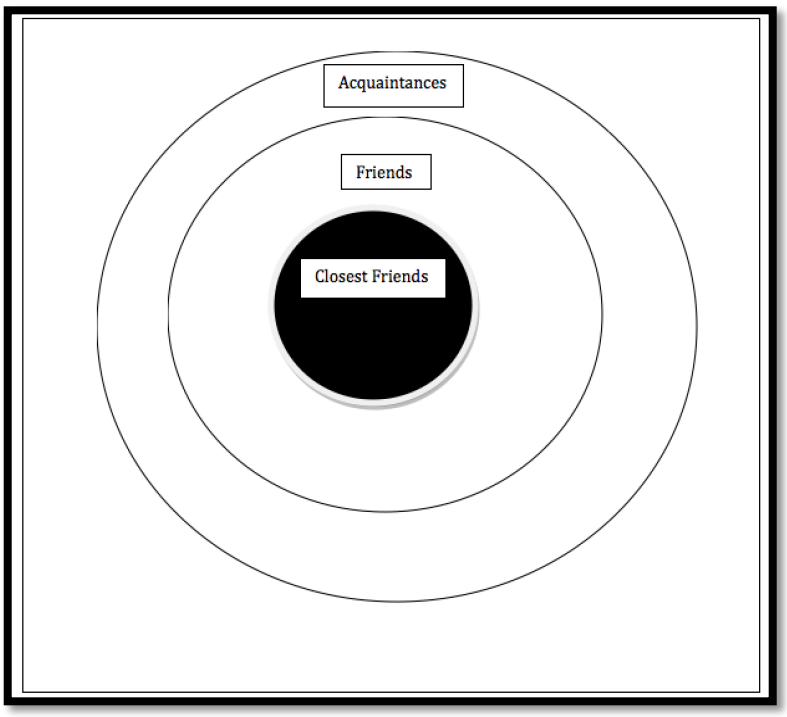
During the interviews, I collected descriptive statistics of each participant (i.e. age, education level, employment status) and asked them to tell me about their personal experiences using ecstasy. This allowed me to start a conversation and expanded my knowledge of their lives and experiences (Bernard 1998:349). Next, I used the two graphs I made as prompts to encourage discussion (see Figures 2 and 3). I asked the participants about their opinion of the accuracy of these findings and about their own experiences of getting ecstasy from friends and strangers, their experiences and strategies of minimizing potential harms associated with using ecstasy, and about any harm that they or people they know have experienced.

Also, I showed a diagram I made illustrating the participant's social groups consisting of best friends, friends, and acquaintances (see Figure 4). I showed this diagram to participants during the interview, a method known as *graphic elicitation,* because this can instigate data collection by encouraging participants to discuss the researcher's topic of interest (Crilly et al. 2006; Umoquit et al. 2008). Furthermore, graphic elicitation can help participants explain their ideas easily because they can reference the diagram (Crilly et al. 2006:348). After I described the diagram and explained that it was one of many potential representations of their social network (Crilly et al. 2006:360), I asked participants to tell me about each group of people in the diagram,

and I asked questions about these groups, focusing on their ecstasy use and their opinions of the participant's ecstasy use. I asked participants to tell me primarily about their best friends, friends, and acquaintances who live in Victoria and attend parties, clubs, or raves because I wanted to narrow the context of my research by focusing on these individuals only.

Next, I asked questions about ecstasy purity to encourage conversations about the meaning of ecstasy purity, the strategies they and their friends use to determine the purity of ecstasy, and their experiences consuming impure ecstasy. This led into a conversation about ecstasy testing. For example, I asked participants about their experiences testing their ecstasy, using either an ecstasy testing kit or laboratory services. Lastly, I encouraged a discussion period at the end where the participants asked me questions, made comments, and told me about any issues regarding ecstasy that they wanted to discuss.

**Figure 4: Social Groups Diagram**



Ethics

The Human Research Ethics Board (HREB) at the University of Victoria approved my study in September 2014. I took several measures to fulfill my responsibilities to the participants, especially in regards to the main principles that advise these responsibilities: confidentiality and consent (Green and Thorogood 2009:72). I ensured the participants' confidentiality in several ways. First, I did not collect their personal information, including their full name, address, date of birth, or any other information that would allow anyone to know they participated in the study. On the consent form, I asked participants to sign their initials instead of their full name to protect their anonymity. Second, I protected the identity of participants by using pseudonyms and changing or omitting place names that they mentioned, including the names of businesses, because this helps protect the participants' identity when I disseminate my results (Green and Thorogood 2009:71; Padgett 2012:85).

In addition, I ensured my research was based on informed consent by taking the following steps: First, I provided the participants with a detailed consent form outlining my study prior to the interview via email so they could have plenty of time to read it. Then, when we met for the interview, before the interview began I gave the participants another copy of the consent form for them to review. I also verbally explained my project to them and the highlights of the consent form. I answered any questions they had about the study and the consent form, and then they initialed the form. I kept the initialed consent forms for my records and I gave the participants another copy of the consent form to keep (see Appendix 3 for Consent Form).

Second, I informed participants that they could withdraw from the study at any time, during the interview or afterwards, without any consequences or any explanation. I told them if they chose to withdraw from the study after the interview, their data would not be used in the

analysis; it would be destroyed immediately. Also, I informed them that if they chose to withdraw during the interview or anytime thereafter, they would still receive the full honorarium.

Furthermore, since the use of ecstasy is illegal and possibly problematic or upsetting for the user, I had to be aware of potential emotional distress, a type of ethical problem that can occur when discussing sensitive subjects in qualitative research (Padgett 2012:86). I utilized measures to protect participants from emotional discomfort in response to my questions about ecstasy use by taking these steps prior to the interviews: First, I informed participants that they could refuse, for any reason, to answer questions that made them feel uncomfortable, and there would be no consequences for refusing to answer any questions. Second, I told the participants that they could take a break from the interview at any time. Third, I told participants that if they would like to discuss their feelings or drug use, I had contact details of local social service and health agencies. After the interview, I gave each participant a referral card that had the telephone numbers for Vancouver Island Crisis Line, Alcohol and Drug Information Referral Service, and University of Victoria Counselling Services. Overall, the steps that I took ensured my project met the standards of confidentiality and consent and protected the emotional well-being of the participants.

Analytic Methods

To familiarize myself with the interview data, I read the transcripts multiple times and wrote notes about patterns I noticed (Braun and Clarke 2006:87; Vaismoradi et al. 2013:401). Then, I used *thematic analysis* to analyze the transcripts*:* "a method for identifying, analyzing and reporting patterns (themes) within data" (Braun and Clarke (2006:79). *Thematic analysis* is a "distinct" and "fundamental" descriptive research approach for analyzing qualitative data (Vaismoradi et al. 2013:403). Even though it is a descriptive approach, it still requires

interpretation, and findings from studies that use this approach produce "detailed and nuanced interpretive products" (Sandelowski 2010:78). Furthermore, thematic analysis uses a "factist" perspective, which means statements provided by participants during interviews are assumed to be fairly accurate information about their history, experiences, behaviours, beliefs, and perspectives. This information is treated as a factual statement about or reflection of the participants' real lives (Sandelowski, 2010:80; Ten Have 2004:73). At the same time, thematic analysis is capable of considering the context of the participants and acknowledging, "the ways individuals make meaning of their experience, and, in turn, the ways the broader social context impinges on those meanings" (Braun and Clarke 2006:81). For this reason, thematic analysis has the ability to "yield insightful interpretations that are contextually grounded" (Lapadat 2010:2), and, thus, it is useful for my analysis.

Thematic analysis focuses on identifying and describing *themes: "*fundamental concepts" the researcher is aiming to describe (Ryan and Bernard 2003:87). Braun and Clarke explain, "A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (2006:82). Before my analysis, I created a list of potential themes based on the concepts, ideas, and research questions I wanted to investigate. When I reviewed the transcripts, I confirmed these themes and identified new ones by focusing on repetitions, similarities, differences, and causal relationships ("linguistic connectors") in the women's words (Ryan and Bernard 2003:89-92). All themes I identified helped me answer my research questions and were present across multiple interview transcripts.

I identified major themes and sub-themes in the data, and I describe them all here. I generated these major *a priori* themes (Lapadat 2010:1; Ryan and Bernard 2003:88): *ecstasy use frequency, physical setting, social setting, accessibility, rates of ecstasy use, acceptance of ecstasy use, concerns about impurity, harms caused by impurity, discuss ecstasy with friends,*

*testing kits,* and *laboratory services.* I also found additional major themes while analyzing the transcripts: *experiences with impure ecstasy*, *assessment of ecstasy's physical characteristics,* and *analysis of ecstasy effects.* During my review of the transcripts, I identified multiple sub-themes that helped me understand the major themes. For example, the sub-themes for *testing kits* were *experiences using testing kits, barriers, opinions, and peers' use of testing kits*. The sub-themes for *discuss ecstasy with friends* included *exchange of ecstasy, trust,* and *experiential knowledge.*

During my analysis, I created several *codes*: "labels that assign symbolic meaning to the descriptive or inferential information compiled during a study" (Miles et al. 2014:71). Miles and colleagues argue that coding is "deep reflection about and, thus, deep analysis and interpretation of the data's meaning" (2014:72). To identify, describe, and represent the themes, I developed codes and linked them to the data so they could act as "summary markers" for analysis (Guest et al. 2012:10). My codes were words or phrases, and I wrote them on the right-hand margin of my transcripts in capital letters to represent transcript segments related to that code (Braun and Clarke 2006:89; Miles et al. 2014:72).

I used a combination of inductive and deductive coding approaches described by Miles and colleagues (2014:74-80). First, I used Descriptive Coding, which means I chose a word or phrase to act as a code that summarized the topic of a transcript segment, such as *ecstasy texture* and *ecstasy colour.* Second, I utilized Provisional Coding: I generated a list of potential codes before I interviewed the participants based on my literature review, theoretical concepts, and research questions. These included codes such as *concern, harm,* and *impurity.* Third, I used a technique called In Vivo Coding, which means during my reading of the transcripts, I identified phrases that multiple participants said and I used them as codes, such as *good ecstasy* and *too much*.

During my analysis, I constantly revised my codes by adding and changing codes to

ensure coherence and unity amongst them (Braun and Clarke 2006:89-90; Miles et al. 2014:82). To organize the codes, I used a "cutting and sorting" technique (Ryan and Bernard 2003:94). First, I listed the codes on an Excel® spreadsheet on my computer. Then, I copied transcript segments that represented each code into the spreadsheet. In order to incorporate the context of each segment, I included a portion of the surrounding data and wrote comments to help explain the context, such as what question I asked to prompt the participant to discuss a particular topic or details about when and where a situation she described occurred (Braun and Clarke 2006:89; Ryan and Bernard 2003:94). Next, I reviewed and re-organized the codes and the associated data in my spreadsheet in order to identify and confirm themes and ensure the themes represented my coded segments and the entire data set (Braun and Clarke 2006:89-91; Vaismoradi et al. 2013:402).

In addition, I asked an undergraduate student with experience analyzing qualitative data to assist me with coding because attempting to strengthen the agreement between coders can improve the "credibility, validity, and utility of qualitative research findings" (Carey 1996:4). Likewise, Guest and colleagues argue that improving "intercoder agreement" can increase the reliability of a qualitative analysis (2012:11). For these reasons, I followed Campbell and colleagues' (2013) recommendations for reliably coding in-depth semi-structured interviews with a second coder: First, I explained to my assistant the details of my research project, the codes and themes I identified, and how I developed them. Then, she reviewed the transcript data to see if she agreed with them. During her analysis, she identified two additional codes as well as a few quotes that connected to an existing code that I had not tagged. We discussed our discrepancies and I agreed with her findings, so I added the codes to my list. Once I had my final list of codes and themes, I read the transcripts again, applied the additional codes to the data, and tagged the quotes that I had missed. At this point, I felt my code and theme list was complete.

# Chapter 3: Results

In this chapter, I present the results of my quantitative and qualitative analyses. First, I highlight the descriptive statistics of my interview participants. Second, I discuss the results of my statistical analysis of the data collected by the Centre for Addictions Research of British Columbia (CARBC) via the Canadian Recreational Drug Use Survey (CRDUS). Third, I explain the results of my semi-structured interviews.

## 3.1 Sample Descriptive Statistics

The ten women I interviewed had a mean age of 21 years with a range of 19 to 27 years. The women were university students in their second, third, or fourth year of an undergraduate program. The eligibility requirements did not include education level or student status, but it was not surprising that all participants were university students since I displayed recruitment posters on post-secondary campuses only. Five of the women were currently working part-time and the rest were not currently employed but usually work seasonally (see Table 2).

**Table 2: Descriptive Statistics of Interview Participants**

| Participant* | Age | Year of University | Employment |
|---|---|---|---|
| Dayna | 20 | 3rd | Seasonal |
| Taryn | 20 | 2nd | Seasonal |
| Emily | 21 | 4th | Seasonal |
| Mandy | 21 | 4th | Part-time |
| Heidi | 22 | 3rd | Seasonal |
| Laura | 27 | 3rd | Part-time |
| Marg | 23 | 4th | Part-time |
| Ashley | 19 | 2nd | Part-time |
| Anne | 19 | 2nd | Seasonal |
| Tia | 19 | 2nd | Part-time |

*The participants' names are pseudonyms.

## 3.2 Quantitative Results

Prior to the interviews, I analyzed the CRDUS data that CARBC collected in 2012. To examine the strategies that 69 CRDUS participants used to minimize possible harm from ecstasy

use and to study their sources of ecstasy, I analyzed answers to three CRDUS questions. For the first question, *What, if any, steps do you take to minimize the potential harms associated with ecstasy,* 73.9% of the participants said they discussed purity of ecstasy with friends, 33.3% checked drug information websites, 17.4% used a testing kit, 2.9% asked harm reduction services for advice, and 0% owned a testing kit. For the second question, *In the past 12 months, have you taken ecstasy from an unknown source (i.e. bought from a stranger at a club),* 44.9% replied "yes," while 55.1% replied "no." For the third question, *In the past 12 months, have you taken ecstasy from a friend, even though the source was unknown (i.e. you don't know who your friend got it from, but they insist the source is reliable?)*, 62.3% replied "yes" and 37.7% replied "no." I made two bar graphs depicting these results, and showed them to the women I interviewed to encourage conversations about harms, ecstasy purity, and the strategies they used to determine the contents of their ecstasy (see Figures 2 and 3).

**3.3 Interview Results**

In this section, I organize the results into four categories: *Ecstasy Use Patterns, Normalization of Ecstasy Use, Harms of Ecstasy Impurity,* and *Strategies for Determining Ecstasy Purity*. Within these categories, I discuss the major themes and sub-themes that I identified in the interview data. First, I explain the participants' ecstasy use patterns, including the frequency of their use, the settings in which they use ecstasy, and whom they are with when they use ecstasy. Second, I outline how the concept of *normalization* relates to the participants' and their social groups' ecstasy use in Victoria. Third, I discuss the women's perceptions of harms caused by ecstasy impurity. Finally, I explain the strategies the women use to determine the purity of their ecstasy and the reasons they choose these strategies.

Ecstasy Use Patterns

In this section, I outline the ways in which the women use ecstasy. First, I discuss the frequency of their use and the factors that influence it. Second, I explain the physical settings in which they use ecstasy. Third, I discuss their social setting, meaning whom they are with when they use ecstasy, and why they are typically with these individuals. By identifying their ecstasy use patterns, we can better understand their risk perceptions, strategies for determining purity, and reasons for choosing these strategies.

***Frequency of Use***

To encourage the participants to talk about their frequency of ecstasy use and the reasons for this level of use, I asked them questions about how often they use ecstasy and the factors that affect their use (see Appendix 4). All participants had used ecstasy at least six times during their lifetime, and at the time of the interview they were using it monthly or more frequently. On average, participants reported using ecstasy one to four times per month with most usually using one to two times per month; however, some participants' use frequency fluctuated over time. The main factors influencing frequency of use were responsibilities and health effects.

First, work and school responsibilities influenced how often participants used ecstasy:

> MC: How often do you use ecstasy?
> Ashley: On average two to four times a month.
> MC: What decides how often you'll do it?
> Ashley: Work and school schedules and events and things. I usually just do it when there's something to go to, like a concert or a party, or if you've got a Friday night with nothing to do sometimes me and my friends will just do it at somebody's house and hangout there. It depends what you've got going on. If you have a lot of stuff to do you don't want to do it.

Similarly, Taryn emphasized the importance of doing well in school and how she did not want her ecstasy use to interfere with her school performance. This was evident in her explanation of why she decreased her ecstasy use from weekly to twice per month during the past year: "When I

started this semester - it's my second year - I wanted to really power into it because my first year was a little bit rough getting used to university, so I thought I had a better system going and I wanted to keep it that way. I wanted to make sure I didn't falter too much in my studies." She felt that using ecstasy every week might affect her school performance, so she decreased her frequency of ecstasy use.

Several participants talked about trying to maintain "balance" in their lives regarding school responsibilities and using ecstasy. A few participants even included their ability to balance schoolwork and ecstasy use in their description of themselves when I asked, *How would you describe yourself*? For example, Anne explained, "I like to- like I'm good with school and studying but I also like to have a lot of fun. I like to balance those two things and I think I do a pretty good job at it." Similarly, Tia said, "I think I'm the type of people (sic) that can go out and have fun but still study and do well in school and have my life on track." Overall, participants portrayed themselves as responsible ecstasy users who strived to maintain a balance between using ecstasy and fulfilling responsibilities, especially regarding school, and this desire for balance influenced how often they used ecstasy.

Secondly, health effects also affected how often participants used ecstasy. If participants felt ecstasy use was negatively impacting their health, they decreased their frequency of use. For instance, Dayna explained that last year she was using ecstasy almost every weekend, but recently she decreased her use to once or twice per month because it was affecting her mood:

> I've had times before where I've gone through- there's been a month where I've done it too much and then the next couple of months I'm not myself and I know that, and so it can last a long time. And that's part of my reasons why I'm not taking it as much anymore because I need to have a stable mood, and so I've found that limit. [Dayna]

Other participants decreased their ecstasy use if they felt it caused fatigue or low energy. Evidently, participants regulated how often they used ecstasy to ensure it did not interfere with their responsibilities or their health, which allowed them to maintain "balance" in their life.

***Physical Setting***

To encourage a conversation around setting, I asked the women questions about where they usually use ecstasy and why (see Appendix 4). Participants reported using ecstasy in a variety of settings, including parties, at home with friends or boyfriends[1], and camping with friends; however, the women preferred to use ecstasy while attending performances by DJs or bands at music festivals, nightclubs, raves, and concerts. I asked participants, *Why do you usually do ecstasy at shows or events?* They explained that using ecstasy enhanced the experience of listening to music:

> [Umm] I think since it gives you more of a euphoric high you tend to appreciate the music a little bit better, especially with today's society, like EDM [electronic dance music] is such a popular genre of music, so I feel like it brings you closer with the music and it just gives you a whole new appreciation of certain things. [Emily]

> It's an alternative to drinking. It's more fun than drinking. Concerts and things just seem a lot better when you're on it. Like the vibrating feels cool of the bass and everything, and you feel like dancing and moving. [Ashley]

Overall, the women chose to use ecstasy in particular physical settings, primarily events that involved music, because using ecstasy made listening to music more enjoyable. Not only did listening to music increase the enjoyment of physical sensations, such as the feeling of the vibrating bass, but it also made the women feel "closer" to the music and appreciate it more.

[1] The women who talked about their intimate partners referred to them as their "boyfriends," so I use this term instead of a gender-neutral term, like "partner."

***Social Setting***

The women described the social setting in which they typically used ecstasy and explained why they used ecstasy with certain individuals. To prompt them, I showed them the Social Groups Diagram (see Figure 4), then I asked them questions about the people represented in the diagram, and their interactions with them (see Appendix 4). I also asked them to tell me about other individuals they used ecstasy with who were not represented in the diagram. A few participants mentioned using ecstasy with their boyfriends, but the majority used ecstasy primarily with female friends. This was the case for the first time they used ecstasy and the proceeding times they used ecstasy. The women explained they preferred to use ecstasy while they were with other ecstasy users who made them feel comfortable and that they knew personally. While they referred to these individuals as "friends," "close friends," "best friends," and sometimes "boyfriends," for this section, I refer to all of these people as "friends."

The two main reasons that participants preferred to use ecstasy with ecstasy-using friends were that friends offered support and using ecstasy together strengthened bonds. First, the women chose to use ecstasy with ecstasy-using friends because their friends offered them support. This was evident when I asked Emily, *What makes getting high on ecstasy fun?* She explained, "This is going to sound really stupid, but it's because all my f- when I'm on it my friends are doing it as well, so when we're all on it together it makes us closer and it makes it easier that you're not on it by yourself and you have that support if something goes wrong." The support offered by friends was most evident during participants' first times using ecstasy:

> Laura: It was like the biggest high of my life. I immediately shut down. I was standing there talking with somebody and then I was just like, "your shirt is moving" and then I was like out. Like I got taken to a room and they were like, "you're going to be ok" and they had to stay and comfort me for what felt like hours. But it was fun.
> MC: Where were you?

> Laura: I was at a friend's house. It was good. They took me to a room – two girls – and they were good friends so we just all were high together and we just stayed in there and we were calm and finally it passed and we were able to join the rest of the group again.

Participants also offered their friends support during their first time using ecstasy:

> My roommate, it was her first time doing it, so she definitely needed- not needed, but she wanted the support of me being there. I wasn't going to do it that night but she said, "well if I'm doing it then you have to do it." Yeah, stupid peer pressure [laughter], but- so I ended up doing it. It helped her get through it just because she knew I was on it so she was able to rely on me a little bit throughout the night. [Emily]

Overall, experienced ecstasy users provided information and support to other ecstasy users during difficult or novel experiences. This made the women feel safe and comforted while using ecstasy.

Secondly, most participants used ecstasy with ecstasy-using friends because it strengthened the bonds between them:

> I think it's a really good—like for me my favourite part about it is being able to talk to people and not have to talk about small talk. You can just get right into—for me it's all about bonding and the bonding experience and, lots of times it brings friends closer, you learn things about people that you normally wouldn't learn and it kinda just gave me a better self-awareness, I'd say. [Dayna]

Similarly, Taryn explained, "[Ecstasy use] is very connecting with others. Like there's a huge connection among the people that you're with." In some cases, using ecstasy with other ecstasy-users strengthened long-term bonds. For instance, Dayna said, "[Umm] so my closest friends are definitely the people who I do M with all the time, and I think it's because I've done M with them that they're my closest friends." Overall, the women preferred to use ecstasy while they were with their ecstasy-using friends because these individuals offered support, and the women enjoyed bonding and connecting with them.

Normalization of Ecstasy Use

In this section, I discuss how the concept of *normalization* relates to ecstasy use amongst the participants and their peers in Victoria who attended parties, raves, or clubs. Since the normalization thesis can oversimplify drug use by young people when researchers try to apply it to youth in general (Gourley 2004; Shildrick 2002; Shiner and Newburn 1997), I chose to examine the normalization of ecstasy use amongst individuals who lived in Victoria and attended parties, raves, or clubs. I focus on three of the factors that Parker and colleagues (2002) believe indicate if ecstasy use has become "normalized" because I found evidence for them in the interview data: accessibility of ecstasy; rate of regular ecstasy use; and ecstasy users' and abstainers' acceptance of "sensible" ecstasy use.

***Accessibility***

To assess accessibility of ecstasy, I asked the women questions about how easy it was for them to obtain ecstasy (see Appendix 4). The majority of participants reported it was "easy," "pretty easy," or "very easy" to obtain ecstasy in Victoria, and they could obtain ecstasy within a day if they wanted. Ashley explained ecstasy was easier to obtain than "weed" or marijuana, which people generally perceive to be an accessible drug in Victoria:

> MC: How easy is it to get ecstasy?
> Ashley: Easier to get than weed.
> MC: Wow very easy.
> Ashley: Very easy.

Emily thought it was easy to obtain ecstasy in Victoria compared to other cities because Victoria had a large student population. She explained, "Living in Victoria, it's more of a university-student-population, so it's a lot easier to access certain things." In contrast, Marg thought her ability to access ecstasy was dependent on her connections with ecstasy suppliers instead of her geographical location: "There's a couple of my friends who I know I can get it through and if they're around then it's really easy and if they're not then I would have no idea how to get it."

While Marg's access to ecstasy depended on certain friends who supplied it, her connection with these friends made it "really easy" for her to obtain the drug.

***Rates of Ecstasy Use***

Participants believed ecstasy to be a popular drug in Victoria. For instance, Anne told me "everyone is doing it now, I think." Furthermore, Dayna thought ecstasy was the most common drug for people to use in this city:

> It's by far the most, very common drug in Victoria in relation to other areas. Like I know my boyfriend, he was in the party scene and he never had done M before but it was always like coke and other drugs are way more in high demand, but here in Victoria it seems to be such a recreational, like kind of the recreational choice, I'd say. [Dayna]

While other drugs, like cocaine, were more popular in other cities, ecstasy was the "recreational choice" in Victoria. Likewise, Emily, who thought the majority of her acquaintances, friends, and close friends had tried ecstasy, believed ecstasy was widely used in Victoria, especially amongst university students. Not only did she think ecstasy use was popular amongst this cohort, she thought it was "acceptable:" "In the university society it's pretty acceptable, but going out into the real world it's not really that acceptable to be doing this many drugs, but here, yeah, it's pretty acceptable to do it." While a few participants commented on the use of ecstasy by university students, or by Victoria residents in general, most participants provided more in-depth details about the use of ecstasy by their acquaintances, friends, and close friends.

During the interviews, I showed the women the Social Groups Diagram (see Figure 4), and I asked them questions about the ecstasy use of their close friends, friends, and acquaintances who lived in Victoria and attended parties, raves, or clubs. I defined acquaintances as "a person you are familiar with but you do not necessarily consider them a friend, such as a friend of a friend or a classmate." I did not provide a definition for "friend" or "close friend;" I let the participants

interpret these categories any way they wanted. Specifically, I asked participants what proportion of these groups used ecstasy.

First, a few participants did not know how many of their acquaintances used ecstasy because they did not have personal conversations with them nor know many details about their lives, so they felt incapable of providing information about their acquaintances' ecstasy use. However, the majority of the participants assumed or knew that at least some of their acquaintances who attended parties, raves, or clubs used ecstasy regularly, and four participants surmised that the majority of them used ecstasy regularly. These estimations were dependent on how the women defined their acquaintance group, and the information and perceptions they had of this group's ecstasy use. For Dayna, her perception that some of her acquaintances used ecstasy was based on her experiences:

> And then acquaintances, there's a couple people who I'm surprised- like for example, in my program that I'm in there's a lot of people who are just- it's all about school, nothing else. And there's been a couple time I've actually gone out to the club and they're- you can tell they're on M too and it's… so sometimes it's people that I would never ever guess, and you see it and you're like, "oh ok", like it's a bit interesting. So at first, if I had never run into those people I definitely would have said, "no, nobody does" but it's surprising how many people actually do… do it, especially around here. [Dayna]

While most of the women made estimates about their acquaintances' ecstasy use based on their experiences and perceptions, Laura felt confident that the majority of her acquaintances used ecstasy because she had talked to them about their ecstasy use: "My acquaintances would probably be people from school and- it's funny, we were talking about it today. They're all trying not to…We've all done it; we're all trying to not do it." She considered the students in her university program to be her acquaintances, and she knew they used ecstasy regularly because they had talked about using it and trying to stop.

Second, the women felt more confident estimating the popularity of ecstasy use by their friends who attended parties, raves, or clubs than their acquaintances because they were more knowledgeable about their friends' ecstasy use than their acquaintances' use. While two women did not make an estimate of what proportion of their friends use ecstasy, the others reported varying amounts of ecstasy use by their friends. Two participants said "some" of their friends used ecstasy, while two participants believed about half of their friends used ecstasy regularly. In addition, four participants reported that "most" of their friends routinely used ecstasy, albeit at different frequencies:

> MC: What about your friend circle? Do lots of those people use ecstasy?
> Ashley: Yes. Probably like three-quarters of them do, but not very often. A lot of people just do it like once every few months, just like at a big birthday party or something like that, and then there's others ones that do it weekly I guess.

While Ashley believed about 75 percent of her friends used ecstasy, they did so at different frequencies: some used weekly, while others used less than monthly. Like the participants, the participants' friends used ecstasy at varying frequencies.

Third, all of the participants felt confident estimating what proportion of their close friends who attended parties, raves, or clubs used ecstasy because they knew their close friends intimately and they primarily used ecstasy with people from this group, so they were knowledgeable about their ecstasy use. Participants who had boyfriends included them in this category. All participants reported that at least some of their close friends used ecstasy regularly. Three participants said less than half of their close friends used ecstasy, while one participant explained about half of her close friends did. In addition, six participants claimed most of their close friends used ecstasy, which included two participants who said almost all of their close friends used it regularly. Dayna said, "Mostly I would say all of my closest friends do." Similarly, Emily told me, "Close friends definitely about 99 percent- they do it as much as I do, for sure like

once a month or something like that." Overall, the majority of the participants reported higher proportions of ecstasy use amongst their close friends than their friends and acquaintances, which could be because a higher proportion of their close friends used ecstasy or because they were more knowledgeable about their close friends' ecstasy use.

***Acceptance of Ecstasy Use by Ecstasy Abstainers***

I asked the women questions about the opinions, comments, and behaviours of their close friends, friends, and acquaintances in Victoria who attended parties, clubs, or raves but who did not use ecstasy to determine if these people accepted or disapproved of the participants' ecstasy use (see Appendix 4). Seven participants felt all of their ecstasy-abstaining friends, including their close friends, accepted their ecstasy use. Their friends had never expressed concern about their use of ecstasy, and they sometimes interacted with these people while they were under the influence of ecstasy:

> MC: Do all of your closest friends use ecstasy?
> Dayna: No, not all my closest friends…There's a couple who are very, like there's like one or two I'd say that are adamant about not doing it but they'll still come along and party with us and have a fun time and everything like that so they're accepting of it, but yeah. Mostly I would say all of my closest friends do.
> MC: So the people that don't use it, like your close friends, you all still go out and hang out on the weekend and it's not a problem?
> Dayna: It's not weird at all. Like yeah, one of the girls its like she's been my friend since I was two years old. She's kind of like my sister and she knows people have their own opinions but yeah, so she'll still come out with us and party with us while, like, we're on M or ecstasy. She'll have a great time and everything like that.

Even though some individuals abstained from using ecstasy, most of them were still comfortable interacting with the ecstasy users while they were high. Marg thought this was because multiple individuals in her friend group used ecstasy, so the ecstasy abstainers accepted this behavior:

> Marg: I think because there's always at least a group of us that are doing it that its harder to be concerned because it's like, "well you guys all took ecstasy so you can't be…"- It's not so much of a worry as just one person taking it all the time by themselves.

> MC: It's more normal in your friends and close groups, so nobody thinks anything of it?
> Marg: Yeah exactly. Even if they don't do it themselves they're not going to be concerned if other people are.

According to Marg, if only one person was using ecstasy in a group, then ecstasy abstainers might worry; however, if multiple people in a group used ecstasy, then ecstasy abstainers would not be concerned.

Similarly, Tia and Anne believed their ecstasy-abstaining friends and close friends currently accepted their ecstasy use; however, in the past some did not. When Anne was in high school, she used ecstasy one to two times per month, and some of her ecstasy-abstaining friends told her they were worried about her ecstasy use because she was "doing it too much." Since she was a teenager at the time, her friends thought using ecstasy once or twice per month was excessive; however, now that she was an adult nobody had expressed concern about the frequency of her use, even though she used it at similar intervals. Likewise, friends of Anne were concerned about her use of ecstasy in the past, but not anymore: When I first started doing it, my close friends were like, 'oh isn't that really bad to do?' and all this stuff, but now they understand that it's ok. People do it every once in a while. It's fine." Anne explained that her close friends, most of whom did not use ecstasy, now accepted her ecstasy use because it was appropriate to do it "every once in a while."

As for the other participant, Ashley, she had a few friends who did not accept her ecstasy use. For example, one of her close friends made comments regarding her ecstasy use that portrayed disapproval:

> MC: Has anyone ever expressed concern about your ecstasy use?
> Ashley: Yeah just like the little comments, like "why do you do that?" and stuff like that, but nobody has ever said, "You shouldn't do that" or anything like that. There's never been a major concern.
> MC: Ok, so when your close friend makes the comments to you what do you do?
> Ashley: Pretty much just laugh it off and ignore her.

> MC: You carry on.
> Ashley: Yeah it's usually just a one second "whyyy?" or something like that and then we move on.

While this friend showed she did not fully accept Ashley's ecstasy use, they were still friends. She believed some of her friends, along with other ecstasy abstainers, disapproved of ecstasy use because they were against drug use in general:

> Generally I find people that have used it before don't see it so negatively because they obviously understand why you would try it because they did, but people that are just completely against drugs and would never try it kind of thing see it negatively and if you do it they view you in that way too. [Ashley]

She thought individuals who had not tried ecstasy, including a few of her friends and several of her acquaintances, did not understand why people used it and had negative perceptions of it, so they disapproved of it.

Similarly, Taryn surmised that some of her acquaintances might not approve of her ecstasy use, if they knew about it:

> MC: Do you think anybody in your acquaintance group would care that you use ecstasy? Maybe classmates or anyone like that that's not really in the party scene?
> Taryn: Maybe. I think that people who don't have any knowledge on it or any experience with it, they have a different idea of it. I mean, I don't want to say that it's good or anything, but you're brought up in school and stuff to know that it's bad and they do teach a lot of "don't do drugs." It's kind of preached at us since we were kids, so I'd say if anyone who is not in the scene would know about it maybe they would be concerned or at least- yeah probably.

She contributed any potential disapproval of ecstasy use to a lack of experience and knowledge of the drug. While ecstasy abstainers might think all ecstasy use was dangerous because that was what they were taught in school, she explained that her friends and close friends knew she was an "educated" and "responsible" ecstasy user.

While a few participants believed some of their acquaintances might disapprove of their ecstasy use, the rest did not think their ecstasy-abstaining acquaintances would care that they used ecstasy. Several women explained that since ecstasy use was popular in Victoria,

particularly at parties, clubs, and raves, ecstasy abstainers were accustomed to seeing this behaviour in these settings, so they accepted it. For instance, Mandy did not think any of her acquaintances, friends, or close friends would react if they witnessed her using ecstasy at a party:

> Mandy: I don't think most people would give me a second look if they saw me doing it.
> MC: Why do you think that is? Why is it not a big deal?
> Mandy: It's so normal; like it's so- everybody is doing it. It's normal to see it at parties and stuff.

Since "everybody" used ecstasy, it was a "normal" and accepted behaviour at parties and similar settings. Overall, participants perceived that the majority of the people they knew, including ecstasy abstainers, accepted their use of ecstasy, a drug that was popular in Victoria, especially amongst their close friends and friends.

***Acceptance of Ecstasy Use by Ecstasy Users***

I asked the women about the opinions, comments, and behaviours of people they knew who used ecstasy to determine if these people accepted or disapproved of the participants' ecstasy use. I also asked about the participants' expectations and concerns surrounding other people's ecstasy use, so I could examine if they accepted or disapproved of their ecstasy use (see Appendix 4). All participants reported that other ecstasy users approved of their ecstasy use since they used the drug too, and none had expressed concern about their use. In addition, the participants approved of other people using ecstasy, as long as they used it appropriately in regards to the amount, frequency, and context of ecstasy use.

First, participants identified an amount of ecstasy they thought was acceptable to consume in one session. They explained a person should not consume more than one or two "doses" per night. The dose could be in the form of a pill, capsule, or "parachute:" loose powder wrapped in paper then swallowed. For example, Mandy explained, **"**I think two is acceptable but I think past that I don't think is necessary. I don't know why people do that." When she commented, "I don't know

why people do that," she frowned and rolled her eyes, suggesting she disapproved of ingesting more than two doses of ecstasy in one session. Similarly, Taryn revealed her opinion that ecstasy users should limit the amount of ecstasy they use when she told me about her friend who overdosed on ecstasy a few years ago:

> She's ok now but she's told me this story a few times. I don't know. It's not good. It's kind of scary, but again that comes to your own safety precautions and your own behaviour. Six pills- you can't think that that's a good idea, you know. Even if they're not doing anything, they say that sometimes it takes a while to kick in and by the time it does you've already taken all those. [Taryn]

She believed her friend should have taken "safety precautions" that included regulating how many pills she consumed in one session, which highlighted her beliefs that "sensible" ecstasy use included consuming a small number of doses.

Second, participants identified a frequency of ecstasy use that they felt was "too much." The majority of participants felt ecstasy users should use ecstasy less than once per week, and any use beyond this amount would worry them. For instance, Laura said, "if you're doing it more than once a week, even that's too much, but like, yeah. So any kind of use that's like once a week or more would freak me out a little bit. I might want to talk to them." In some cases, excessive ecstasy use could damage friendships:

> MC: If your friend was using it every week, would that change your friendship?
> Anne: Probably. I'd be concerned about them and they'd probably want to do that all the time so maybe I'd distance myself from them a bit.
> MC: Ok. Why would you distance yourself?
> Anne: I don't know. I don't want to be sucked into excessive drug use I guess. If you do it that often then you're just entering a dangerous situation. I don't want to be part of it.

> Ashley: I knew one guy that did it more than once a day for like four months.
> MC: Wow one of your friends?
> Ashley: I'm no longer friends with him [laughing].
> MC: Are you not friends with him anymore because he did ecstasy so often?
> Ashley: That was part of it. I tried to get him to stop doing it so often because I think- I don't know if it's ok but it's not so bad if you do it every once in a while but if you're doing it all the time that's not really ok with me.

While a few participants said they would talk to their friends or distance themselves if they thought their friends were using ecstasy too frequently, Ashley ended a friendship with a friend who was using "too much" ecstasy. This showed participants believed that "sensible" ecstasy use involved using ecstasy less than weekly.

Participants thought ecstasy users should limit their ecstasy use because using ecstasy more frequently might cause health problems or have negative consequences to their life in general. For example, Ashley thought using ecstasy too often was harmful because the chemicals would accumulate in the body: "I think if you do it every once in a while- whatever, [your body] can handle it but if you start doing it all the time you're not giving your body time to clear it out. You just let all the chemicals and things build up. I don't think that's very good for you." Furthermore, Tia worried that excessive ecstasy use might negatively impact people's lives because it would interfere with their work and school responsibilities.

> "I'd get really concerned if they were doing it like every week or a couple days in a row. I'd think they were just throwing their life away, and they're going to end up somewhere bad. Like if my boyfriend did something like that I would just be like- because you have to be responsible and stuff. [Tia]

Since responsibilities should be a higher priority than ecstasy use, she would worry if somebody was using ecstasy weekly or more often. This frequency of use might indicate the person was "throwing their life away," resulting in negative consequences.

Finally, participants felt ecstasy use was only acceptable in certain situations. First, they believed ecstasy users should not use ecstasy alone. For example, Tia said, "If someone just decided to do [ecstasy] alone in their room one night I would be very concerned because it's not the kind of drug you do- and I'd feel like they may have some deeper problems." Laura also alluded to the inappropriateness of using ecstasy alone when she said she would be concerned if a friend was "locked up in a dark basement" using ecstasy. Overall, the participants did not

approve of people using ecstasy in isolation because this was not acceptable and it might indicate the person has a problem.

Second, participants felt ecstasy users should only use the drug when they "go out" to parties, events, or similar occasions, never before or during school or work because this would be "problematic" use. For instance, Ashley explained, "If you use it occasionally, like at parties and events and whatever, then fine but when you start doing it alone, like in your room just because you have nothing to do or like before work or during work or things like that, then I think it becomes a problem." Ashley expressed concern about two people who had used ecstasy at their workplace: "I had an acquaintance that got fired for getting caught doing it at work and then one of my friends still does it at work and they worked at the same place so I'm like, 'why would you do that? They're going to catch you'." This showed her perception that using ecstasy at work was inappropriate. According to the participants, there was an acceptable context to use ecstasy, which they determined based on the location and who was present. Interestingly, all of the participants' ecstasy use patterns fit the expectations they had for other ecstasy users.

## Harms of Ecstasy Impurity

I asked the women questions about the potential harms they perceived associated with ecstasy use; the reasons that ecstasy users might be concerned about ecstasy use; and their or their peers' experiences with ingesting impure ecstasy (see Appendix 4**)**. I defined "harms" as negative experiences or effects. I asked specifically about harms related to using impure ecstasy, if the participant did not mention them**.**

### *Concerns about Impurity*

All participants told me one or more reasons that ecstasy users should be concerned when using ecstasy, but ecstasy impurity was not a common answer. Primarily, they perceived harms

could result from the effects that ecstasy has on the body, such as its effects on body temperature. As a result, they believed ecstasy users should be concerned about these potential health problems: temporary sad mood, nausea, dehydration, over-hydration, and hyperthermia. The women also believed ecstasy users might experience harms as a result of making poor decisions, being vulnerable to sexual predators while high, or taking "too much" ecstasy.

As for ecstasy impurity, three women stated that ecstasy users should be concerned about ingesting impure ecstasy because it could be potentially harmful; however, these women did not seem personally worried about it. For instance, Marg told me ecstasy users probably should be worried about impurity, but she had never experienced problems from it, so she was not personally concerned:

> MC: Are there things that people should be concerned about when they use ecstasy?
> Marg: I guess they probably should. I guess purity is a pretty important thing when you think you're just taking ecstasy but it could be God knows what else, but a lot of the time it's just easy not to care and I've taken it so many times and never taken anything that made me black out or made me do anything really crazy and stupid so I guess just based on my track record I just use that going forward.

Her lack of concern was also apparent in her response to my question regarding what she would tell a first-time ecstasy user: "I would say, 'Just go with it and enjoy it. Don't stress about it'. I don't think there are many bad situations and it's not like taking a hallucinogenic where you can have a bad trip. It's basically just a good time. It feels good, so I feel like you can't really go wrong." Similarly, Laura was not worried about experiencing serious negative effects from ecstasy use because she did not experience any problems the first time she used it:

> MC: Based on your first experience, did that make you want to do it again or after that were you planning not to do it again?
> Laura: I hadn't made up my mind, but I was definitely more- I felt like it wasn't as dangerous as people said because my experience- I had taken three and like felt ok, like I didn't feel like I was going to die or anything. Yeah, it basically just put my anxiety about doing those kind of hard drugs aside.

Since the women did not experience any serious or long-term issues when they took ecstasy in the past, they did not think they would experience harm when ingesting ecstasy in the future.

Furthermore, two participants explicitly stated they were not concerned about ecstasy impurity, which they told me when I asked how they determined the purity of their ecstasy. Mandy told me she had "never even really thought about" the purity of her ecstasy:

> MC: How do you determine if the ecstasy you take is pure or not?
> Mandy: I guess I've never even really thought about it. Like this never concerned me if it's pure or not, like I've never even given it a second thought really.
> MC: How do your friends determine the purity of their ecstasy, or do they talk about it?
> Mandy: Yeah, it's just not really talked about; we just never really talk about it. We just assume that whatever we're getting is what we asked for and it kind of is what it is.

Likewise, Emily had "never really been too concerned" about the contents of her ecstasy, so she made no attempt to determine its purity before she consumed it. Not surprisingly, neither of these women listed "ecstasy impurity" as potential harms ecstasy users should be concerned about.

### *Experiences with Impure Ecstasy*

All of the women thought they might have ingested impure ecstasy in the past. They made this assumption based on word-of-mouth, the appearance of the ecstasy, or its effects. They usually assumed the impure ecstasy contained the drug, methamphetamine, which is nicknamed "meth" or "speed." For instance, Heidi surmised she had ingested impure ecstasy based on information her friends gave her after she consumed it:

> MC: Have you ever taken ecstasy that you knew before you actually took it that it wasn't pure MDMA, or that you at least thought wasn't pure MDMA but you still took it?
> Heidi: No but I have after found out that, and then was like, "oh wow that sucks."
> MC: How did you find out after?
> Heidi: Someone told us after and we were like, "oh wow."
> MC: The time when someone told you after that it wasn't pure did the say what was in it?
> Heidi: Yeah they said it was probably speed.

Furthermore, Taryn believed she had ingested impure ecstasy because she had two batches that had different physical appearances and effects:

> MC: Have you ever consumed ecstasy that you knew beforehand was not pure MDMA?
> Taryn: Yes, I probably have.
> MC: How do you know it wasn't pure, or why do you think it wasn't pure?
> Taryn: I had two batches on my person and they both looked different, and so I just assumed they had different stuff in them. I didn't have any problems with either of them. They didn't feel wrong but they were both kind of different so I thought maybe something is different about them but I didn't know exactly what.

The other participants assumed they had ingested impure ecstasy in the past because they "never really know" the contents of their ecstasy:

> MC: Have you ever consumed ecstasy that you knew beforehand was not pure?
> Mandy: Yeah. [Mmhmm]
> MC: How do you know it wasn't pure MDMA?
> Mandy: [Umm] I don't know. I never really know.
> MC: You just assume that somewhere down the road-
> Mandy: [Interrupting] Yeah. Whatever they say, they tell me, or like yeah. Somewhere along the road something is going to get mixed in there. People are always going to be like cheap about it so they'll put something else in there and won't put the full thing in there, like I don't know.

> MC: Have you ever consumed ecstasy that you knew beforehand was not pure?
> Marg: No. I guess I never really think about it but I've never known that there was something else cut with it.
> MC: Have there been times when you took it and then afterwards or during you thought there was other stuff in it?
> Marg: No I just know that that's probably been the case but I've never noticed that. I mean I think that sometimes it's been cut with baking soda or something like that because you're just doing tons and tons of it and it's having absolutely no effect and in that case yeah, but not in terms of noticing any other drugs it's cut with.

All participants said they knew or assumed they had ingested impure ecstasy at some point in the past, often surmising the ecstasy contained methamphetamine. Their comments highlighted their uncertainty of the actual contents of their ecstasy and their perceptions that impure ecstasy was common.

***Harms Caused by Impure Ecstasy***

None of the women personally knew anyone who had experienced harm from ingesting impure ecstasy, so our conversations focused on their personal experiences regarding harms caused by impurity. Two women believed they had experienced harm as a result of ingesting impure ecstasy. Both of these women assumed the ecstasy contained methamphetamine, and it caused them to have negative experiences. For example, Laura explained the harms she suffered when she ingested impure ecstasy:

> I'm pretty sure that that E was meth or had some kind of meth in it because when I was coming down, that was the worst day of my life. We had been awake- like we couldn't sleep, and usually E keeps you up but not like that. It was 8:30 in the morning and I was like, "dude the sun is coming up. We need to go now. Like this is ridiculous"…Then I get home and I immediately was like so cold but sweating like I've never sweat in my life and it was awful, awful diarrhea and throwing up and like the shakes. It was just awful. All day until like [pause]- I think like maybe 8:30 [at night] I was able to have a bite of food and not feel like I was going to die. [Laura]

Similarly, Dayna said, "There was one time when it was a bad judgment and we went down to Seattle and just picked up off of somebody who we didn't really know very well, and it turned out to be pretty much pure speed, which was not a fun time." Dayna explained the ecstasy made her feel "sick" and "overwhelmed." Both of these women believed they ingested ecstasy that contained methamphetamine due to the effects they felt, which were different than the effects they expected ecstasy to cause.

Interestingly, seven participants told me they had experienced one or more harm due to using ecstasy, but only Dayna and Laura associated these harms with impurity. The others reported they had experienced "blacking out", vomiting, and feeling overwhelmed while under the influence of ecstasy; they also suffered harms the day after using ecstasy, including headache, sore jaw from clenching, and feeling sad. However, they explained that these were the expected

side effects of using ecstasy, or they blamed their negative experiences on taking "too much" ecstasy, or mixing ecstasy with alcohol.

Strategies for Determining Purity

I asked the women questions about what strategies they used to determine the contents of their ecstasy and why they chose these strategies (see Appendix 4). I showed them the bar chart representing the strategies that CRDUS participants used so I could get a better understanding of the reasons why ecstasy users utilize particular strategies (see Figure 3). While I usually asked the women about how they determined if their ecstasy was "pure," a few of them explained they strived to obtain "good" ecstasy, not necessarily "pure" ecstasy. In these cases, I asked the women about their strategies for determining if their ecstasy was "good." Sometimes they used the terms interchangeably. The women reported using one or more of these four strategies to determine the contents of their ecstasy: they assessed the physical characteristics of their ecstasy, they analyzed the effects they felt, they discussed purity with friends, and one person used a testing kit.

***Assessment of Physical Characteristics***

The women had beliefs regarding the physical characteristics of "pure" ecstasy, and these beliefs were informed by information they gathered from their friends and from their previous experiences using ecstasy. Four of them tried to determine the contents of their ecstasy based on its appearance, such as its colour and texture. For instance, Dayna explained how she distinguished between pure ecstasy and ecstasy that had been "diluted:" "You can tell if it's like completely clear and they're in big rocks you know it hasn't been diluted down with anything. If it's white, that means it has had an extra chemical wash on it, and so we try to educate ourselves about what it should look like, and what is shouldn't look like." In contrast, Tia did not know

what colour pure ecstasy should be; however, she thought she could identify impure ecstasy based on whether or not it was in the form of a pressed tab:

> Tia: If it was in a pressed thing you'd obviously think it's not pure at all.
> MC: Ok so pressed tabs are suspicious?
> Tia: Yeah but if you see the actual powder or whatever then you'd be like, "oh." I think it's supposed to be a certain colour; I'm not too sure actually.

Since she believed all pressed tabs were impure, she avoided using this form of ecstasy. These participants analyzed the physical characteristics of ecstasy to make assumptions about its contents, which informed their decisions around if they wanted to ingest it.

***Analysis of Ecstasy Effects***

Five participants analyzed the physical and emotional effects caused by ecstasy to help them determine its content. In order to know what effects to expect from pure ecstasy, some of them read websites and blogs and asked their friends. After they had consumed ecstasy a few times, they compared the effects they felt during each experience and associated differences between the effects with differences in the chemical composition of the ecstasy. For instance, Emily thought pure ecstasy caused distinct noticeable effects, such as relaxation and euphoria, so when she felt these effects it signified she has probably ingested a pill that contains pure MDMA:

> MC: How do you determine if your ecstasy is pure or not?
> Emily: I guess the reaction you get from it. From what I've noticed, pure ecstasy it's more of a relaxing happy rather than a crazy happy. I feel when it's mixed with other stuff, you're gnawing your jaw, you're more anxious, and some people I know get more aggressive. It also depends on your body chemicals, but I think with real, pure MDMA you're not crazy. It's more euphoric if anything.

Similarly, Ashley believed differences in effects signified different pill contents; however, she did not think ecstasy that caused "good effects" necessarily meant it was pure MDMA:

> MC: Do you think you can determine the purity of ecstasy by its effects?
> Ashley: Somewhat, like I've had ecstasy before that just didn't really do anything. Like you get this slight weird feeling and then that's it. You don't get high, nothing like that, but I don't know if that even necessarily is from the purity. Like if you leave it out in the heat it goes bad and it doesn't work anymore, so you

never know. I don't know. I don't think about the purity that much. It's just like good MDMA or bad MDMA. Good stuff makes you feel good; bad stuff just doesn't really do much for you.
MC: Right, that makes sense. How do your friends determine if ecstasy is good or not?
Ashley: Just by taking it and the feeling- how long it lasts. Sometimes certain kinds will just make you feel good and then other kinds will make you high but you kind of feel gross too. Just kind of sick to your stomach so you try and get the stuff that doesn't do that and you assume it's more pure but I don't know what it is in the other stuff that makes you not feel so good so I don't know if it's directly linked to purity.

Ashley and her friends assessed the effects they felt while they were under the influence of ecstasy to determine if the ecstasy was "good" or "bad," not necessarily if it was "pure." They strived to obtain ecstasy that made them feel "good" and avoid ecstasy that made them feel "gross" or "weird" or that had no effect at all.

Furthermore, participants assessed the effects they felt *after* using ecstasy to try and guess the contents of their ecstasy. For instance, if Laura felt ill and nauseous the day after using ecstasy, this indicated she had ingested impure ecstasy:

I think that I usually know [the ecstasy is impure] when I start coming down because the hangovers are all really different. Like I can function on a pure ecstasy hangover. I can function; I'm not going to be like throwing up all day. I've gone to work like that and been totally ok. Then when it's mixed with stuff it's awful. [Laura]

For Laura, determining the purity of her ecstasy was an "after-thought" based on the severity of the hangover she felt after using ecstasy. Overall, these participants determined the contents of their ecstasy by analyzing the effects they felt and comparing their experiences with previous ones. This helped them identify if their ecstasy was "good" or pure; however, none of these women used this strategy in isolation. They all used at least one other strategy, such as assessing the ecstasy's physical appearance or talking about the ecstasy with friends.

***Discussing Ecstasy with Friends***

Seven participants reported they discussed ecstasy with friends to gain information about their ecstasy before they consumed it. This strategy was popular amongst participants for three reasons: their friends usually provided them the ecstasy, they trusted their friends, and their friends had experiential knowledge of the ecstasy.

First, they asked their friends about the purity or quality of their ecstasy because their friends were their main providers of the drug. All of the women had received ecstasy from friends multiple times before. Dayna explained this was a common practice: "I don't normally buy- among closest friends, we'll exchange and share with each other but nobody really ever pays each other for it. It's one of those things that just kind of goes around and it's surprisingly cheap." While most participants exchanged ecstasy with friends at no cost, a few of them sometimes purchased ecstasy from friends:

> It depends how much you want. If you're already at a party and somebody has some then they'll just give you some but if you're planning to go to a show and you want a certain amount then you'd go to your friend's and buy it but if it's just one hit at a party they'll just give it to you, no one cares. [Ashley]

While Ashley usually received ecstasy for free from friends, she sometimes purchased it from them if she wanted a larger quantity. According to the women, the exchange of ecstasy between friends was often paired with an exchange of information about the drug:

> MC: Why are you, or people in general, most likely to discuss purity with friends?
> Heidi: Because they're getting it from their friends most likely, so they're obviously going to talk about it.
> MC: Right. Do you discuss the purity of ecstasy with your friends?
> Heidi: Yeah.

Since Heidi and the other participants usually obtained ecstasy from their friends, including paid and free transactions, this created an opportunity for them "to talk about it," including the ecstasy's purity.

Second, participants discussed ecstasy with friends because they "trust" their friends, which made them trust the information they were receiving. For instance, Dayna discussed ecstasy purity with specific friends who she trusted would provide her with reliable information:

> I think with friends- like for me, I think it depends like who your friends are: if you can trust them; if they know what they're talking about. A lot of people with drugs they try to sound a lot more educated than they actually are. They'll be like, "oh yeah this is…," I don't know. And they say whatever they can just to have that, I don't know… to sound cool. It doesn't but… yeah. If it's people you can trust I think it's a good thing… [Dayna]

When I asked participants to explain why they trusted their friends to provide them with accurate information on purity, a few participants found it difficult to explain. For example, Laura, who occasionally asked friends about the purity of the ecstasy they gave her, was unsure how her friends knew the purity of the ecstasy:

> MC: How do your friends determine the purity of their ecstasy?
> Laura: That has never come up. I have never asked, "how do you know?"
> MC: Why have you not asked them what they do?
> Laura: That's a really good question. I feel so naïve. I feel like I'm just like, "oh well I'm just going to believe whatever you say." I'm an overly trusting person.

Participants did not question how their friends knew the purity of the ecstasy they were giving to the participants. Instead, they trusted that their friends were honest and accurate when they told them the ecstasy was "good" or pure.

Third, participants used this strategy because they believed their friends had experiential knowledge of the ecstasy. The women knew or assumed their friends had ingested ecstasy from the same "batch," so the participants surmised the ecstasy they received from their friends would have the same contents as their friends' ecstasy, and thus the same effects. For instance, when I asked Ashley if she would feel comfortable taking ecstasy from a friend, even if she did not know whom her friend got it from, she explained, "Yes because if they had it I'd assume that they had tried it, and if they're ok then I'd be ok." Marg had a similar belief: "If it's from someone that I

know then other people have done it and then I'll know if it's the same batch or whatever then if other people have done it and they've had a good experience then I'll be happy to do it."

A few participants explained they did not specifically discuss "purity" with friends; instead they only talked about whether or not the ecstasy caused desirable effects. For example, Ashley said, "I don't discuss purity necessarily with my friends, just like whether or not it worked for you, if it gave you a good high, then I would consider taking it from them." If Ashley found "good" ecstasy, then she would recommend the ecstasy to other ecstasy users:

> Ashley: About a week ago a friend was looking for some, and he was talking about how he didn't want to buy it from a stranger because he didn't know what it was or anything like that so I said, "well I've done this stuff before lots of time and so have my other friends and we all think it's good and we like it" so then he wanted some of that stuff rather than just random unknown.
> MC: So did that person go to the same person that you got it from?
> Ashley: Yeah because there had been a few of us who had done it before so you assume it's safe or not going to kill you. I don't know if it's safe but…

Ashley believed "good" ecstasy also meant it was "safe" and not going to cause harm. Likewise, Tia talked to friends about the ecstasy she planned to use to determine its quality:

> MC: Do you discuss the purity of ecstasy with your friends?
> Tia: We don't really discuss it but we do talk about it sometimes, just to know what we're getting and it it's good or not. Yeah, just to know if it's good and there's no other bad stuff in it.

For Tia, "good" ecstasy meant it did not contain any "bad stuff." Whether the women were talking about "good" or "pure" ecstasy, the primary purpose of the conversation was to identify if the ecstasy was going to cause desirable effects.

***Ecstasy Testing Kits***

Only one participant, Taryn, used a testing kit to determine the purity of her ecstasy; the other nine women had not used one. For this reason, I gathered information that might help explain why most of the women did not use testing kits. In this section, I discuss Taryn's reasons for using a testing kit. Then, I outline the barriers that prevented the other women from using

testing kits. Next, I examine the participants' opinions of testing kits. Finally, I discuss their friends' use of them.

***Experiences Using Testing Kits***

While nine of the women had never used a testing kit, Taryn owned and regularly used one. She purchased it a few years ago because of her interest in chemistry: "I'm a chem student so I- once I got into university I started really thinking about my own personal life and how I can make my school applicable to, you know, things in my life." She became aware of testing kits when she visited the ANKORS harm reduction booth at the Shambhala Music Festival because ANKORS was using them to test festival attendees' ecstasy:

> MC: How did you first hear about testing kits?
> Taryn: [Umm] Probably Shambhala. The first time I went to Shambhala because they had huge tents up everywhere, like "come to us to do drugs" then I looked at them and they were all home testing kits. I was curious after that; I thought I'd test it out. Chemistry student so I'm like, "I want to know" [laughter].

Her decision to purchase a testing kit was also influenced by the "overwhelming" and "scary" experience she had during one of the first times she used ecstasy in which she "blacked out" for three hours. She believed her negative experience was the result of her friend giving her a parachute that contained "too much" ecstasy. This experience prompted her to think of ways she could protect herself from future harms:

> MC: So that bad experience, that's why you measure it yourself now?
> Taryn: Yeah and that's why I test it from then on too. Like that was when I never really thought about it much; I was still pretty young.

Even though she did not think her negative experience was the result of ingesting impure ecstasy, it prompted her to purchase a testing kit and start regularly testing her ecstasy. As a result, this was the primary strategy she used to determine the purity of her ecstasy.

***Barriers to Using Testing Kits***

The other women identified multiple barriers that impeded them from using testing kits: they lacked information about them; testing kits were only sold online; and they lacked exposure to them. First, the women had scant information about testing kits. Three participants, including Laura, did not even know they existed:

> Laura: I didn't even know there were testing kits. That's really interesting. A testing kit just to test the purity of a drug?
> MC: Yeah.
> Laura: Like you can buy a kit for cocaine, ecstasy, like all these different things? It's ok if you don't know. I just find this interesting because I had no idea.

The other women knew of testing kits, but their lack of knowledge about them made the women skeptical to purchase them. In particular, they did not know their cost or where to purchase them:

> Actually a few of us have talked about testing kits and stuff and kind of wanted them but we don't know where you would get them or how accurate they are or anything about them really. Like it sounds like a great idea so that you know what you're taking but no one knows how to get it or anything like that. Also, if they were expensive then you're not going to buy it because you could spend that money on ecstasy [laughing]. [Ashley]

Similarly, Anne did not know how much testing kits cost and assumed they were expensive, which made her not want to purchase one. When I informed Anne that some testing kits cost as low as 25 dollars, she was surprised: "Oh really? That's actually really good. I think it would be a good investment." Overall, Anne and the other eight participants who did not use testing kits felt uninformed about them.

Second, the women felt uncomfortable buying testing kits online, which was the only place to purchase them. Some participants felt skeptical ordering goods online in general because they questioned the quality of these goods. For this reason, they were worried that they might receive a counterfeit testing kit that did not work properly, if they ordered it online. In addition, participants worried about confidentiality and privacy issues when ordering a testing kit online,

such as having the purchase listed on their credit card statement, or having the testing kit delivered to their house. For instance, Ashley did not want to buy a testing kit online because she lived with her parents and did not want to get drug paraphernalia delivered to her house:

> MC: Have you or your friends tried looking up information on testing kits?
> Ashley: I've googled it like once a long time ago but that was it. I don't remember what it said, but I live with my parents so I'm not going to order it to my house.
> MC: Yeah that makes it more complicated. "What is this in the mail?"
> Ashley: Yeah exactly. "What did you order in the mail?" "Oh nothing."
> MC: Yeah I understand that.
> Ashley: It would be nice if they were offered somewhere. Like they give free needles out, why not give free testing kits? But it doesn't happen.

She thought testing kits should be more accessible to ecstasy users and available in other locations besides online, possibly for free. Since harm reduction organizations offer free needles to drug users, she thought they should also offer free testing kits to ecstasy users.

Third, participants lacked exposure to testing kits because they did not see them in advertisements or stores, which prevented them from using them. Anne, who did not know how much they cost or where to buy them, explained she had not been exposed to testing kits or information about them: "Nobody I know has them and doing drugs is taboo so they're not advertised." Some participants explained that if testing kits were sold in stores instead of only online, then they would be exposed to them more, and thus more likely to purchase them:

> MC: Do you think if they were easier to access, like if they sold them in stores or if they were more available, do you think you or your friends would be more likely to use them?
> Dayna: Oh for sure. Yes, like if you're constantly being exposed to it, but it's one of those things that's kind of like, "oh yeah we should get a testing kit." It's kind of one of those things in the back of your mind. It's not one of those things that I think about all the time. Like you don't run into contact with it; you have to come up with the idea on your own. It's not put in front of you, and for a lot of people they don't have the time to order it and go through the process of it, but yeah.

Dayna was not regularly exposed to testing kits in stores or elsewhere, so she did not use one; however, if testing kits were sold in stores she and her friends would think about testing kits more often. Consequently, they might purchase them.

***Opinions of Testing Kits***

I asked the women about their opinions of testing kits, particularly if they thought using them was a reliable way to determine purity. While Taryn's opinion was based on her experience using one, the other women's opinions were based on information they had read or heard, including information I provided. For the women who did not use testing kits, I provided a basic explanation of them, which I based on Winston and colleagues' (2001) description. I explained:

> Testing kits include chemicals that you apply to an ecstasy sample to produce a chemical reaction. You compare the colour that the chemical reaction produced to a colour chart, which shows colours produced by a variety of drugs. Testing kits can sometimes reveal if ecstasy contains no MDMA, but they have limitations. For example, interpreting the results can be subjective; testing kits cannot detect all chemicals that could potentially be in ecstasy; and they cannot show if the ecstasy contains multiple chemicals.

Taryn, the sole user of a testing kit, believed testing kits were imperfect but they could potentially protect her against ingesting impure ecstasy. Taryn identified two problems with testing kits. First, she found interpreting the results difficult. This is evident in her description of when she recently tested two ecstasy samples from different batches:

> MC: "What did the results say from the ecstasy you tested?
> Taryn: The two batches that we tested came up at different colours but they were both kind of in the same spectrum. We got some really interesting, weird results. It made us want to get a different test kit because- at first I was super concerned because one of them started bubbling violently and it looked kind of like what the meth colour was but then it went blue. I was like, "ok that's weird." It was kind of shocking because we were like, "none of this makes sense. None of these are actual colours on that spectrum." But then when they stopped reacting or whatever they kind of went- the first one we did went blue perfectly and the next one we did was questionably purple-y something. Then the last one we did was like black. It was kind of weird.

These “weird” results confused her because she did not know how to interpret them. As a result, she did not know if her ecstasy contained MDMA or not. Second, she thought testing kits were not completely accurate because they could not always detect the presence of multiple chemicals:

> I would assume that if there’s [sic] lots of chemicals in it, it’d be hard to tell. All the colours would probably melt into one, I guess [laughter]. Probably overrule one of the other ones. I think codeine was really light green, so how would you be able to see that if your MDMA was really dark blue and there was a little bit of morphine or something in it. I don’t think you’d be able to know. If it’s something completely different then that would be more obvious. [Taryn]

She believed testing kits could not reveal if ecstasy contained MDMA mixed with other chemicals, but if ecstasy contained a “completely different” chemical than MDMA, then the testing kit would show this.

While Taryn identified problems with testing kits, she thought they were the best available strategy for determining purity because they provided “scientific information” about the ecstasy and could help identify if ecstasy contained a chemical with a clearly different chemical reaction than that produced by MDMA. Consequently, she believed testing kits could provide ecstasy users with an extra layer of protection from impure ecstasy: "I don’t think they’re a really great way of doing it but it’s a step closer to knowing what you have.” For this reason, she regularly used her testing kit to test her ecstasy, and she shared her results and her ecstasy with friends.

As for the other women, most had positive perceptions of testing kits. They surmised that testing kits offered protection against impure ecstasy and were more reliable than other strategies for determining purity. Although they had never used testing kits, seven of them thought testing kits were useful because they could help protect people against ingesting impure ecstasy. For example, Ashley stated:

> [Umm] I think kits would be a great way to know if [the ecstasy] is going to do harm to you or not or if it’s got other drugs in it that you don’t know about because you don’t necessarily want to do other drugs. It would be nice to know what’s in it, if it’s laced or if- yeah just if it’s going to hurt you I guess because

> I've never known anybody that was hurt by it but I know a lot of people do end up in the hospital or even die from it. [Ashley]

Ashley felt testing kits could help people identify if their ecstasy contained chemicals besides MDMA, and therefore protect them from experiencing harms caused by impurity. Consequently, Ashley and the other women who shared this perception expressed interest in learning more about testing kits and possibly using them in the future, stating they would "look into them" or they were "interested in using them."

Furthermore, I asked the women what they thought was the "best" strategy to determine ecstasy purity, and six participants assumed testing kits would be. For example, Laura had never heard of testing kits until I told her about them; however, she surmised they would be a better strategy to use than asking her friends about the contents of her ecstasy:

> MC: What do you think is the best way to find out the purity of ecstasy?
> Laura: Probably doing one of those tests, even though there are flaws with it. That sounds like a great idea.
> MC: Why do you think this might be the best strategy?
> Laura: Because it's more scientific than "hey what's in this?"
> MC: What do you think of ecstasy testing kits, even though you've just heard about them this very moment? Do you think they would be reliable?
> Laura: They sound somewhat reliable, much more reliable than my friends.

Participants often described testing kits as "scientific" and "specific" when comparing them to other strategies they used to determine the contents of their ecstasy. Overall, they assumed testing kits would give more accurate results than discussing ecstasy with friends or analyzing the physical characteristics or effects of ecstasy**.**

While the women agreed that using testing kits would be a helpful strategy to determine the contents of their ecstasy, three participants felt they did not need testing kits because they were "recreational" or "casual" ecstasy users. For instance, Dayna, who used ecstasy about one to two times per month, explained that one of the reasons she had not used a testing kit was because she was a "recreational" ecstasy user; therefore, she did not need one:

> I started doing M in very casual amounts and it wasn't a big deal I did it. And then as I started to do it more, I probably should've bought a testing kit, but instead I just bought a big batch, tried it out, and then continued to know how my body reacts to it and what it's like…A lot of other people who do lots of ecstasy I guess and go clubbing all the times, that's their thing that they do all the time, and so it would be more of an investment, but for me I guess I see myself as a recreational- it's recreational and that I don't use it enough. [Dayna]

As a "recreational" user, she believed she did not use ecstasy "enough" to necessitate the use of a testing kit; however, she surmised that individuals who used "lots of ecstasy" might want to purchase testing kits.

Similarly, Mandy believed she did not need to use a testing kit because she only bought and used small amounts of ecstasy occasionally; however, ecstasy sellers or individuals purchasing large quantities of ecstasy might want to use testing kits:

> MC: What do you think of ecstasy testing kits? Do you have an opinion about them?
> Mandy: I don't think they're totally necessary… People like me that are doing it, I don't think we care that much. Like I feel like people that are selling it would probably be more interested in it and that kind of thing but I think the average person buying it is just stoked they're getting it from somebody because it's kind of like- it's not hard to get in Victoria but- I don't know... They just want to have a good time; they don't want to really care what's in it… Yeah, unless they're spending a lot of money on something, like if they're buying a pound or something you're going to want to test it, but it's not very common.

Not only did Mandy perceive testing kits to be "unnecessary," but she also believed ecstasy users in general were not interested in using them because they "don't really care" what is in their ecstasy. In her opinion, the only people who might be interested in determining the content of their ecstasy were ecstasy sellers or individuals purchasing large amounts, not the "average" ecstasy user.

***Peers' Use of Testing Kits***

I also asked participants about their friends' use of testing kits. Taryn, the only participant who used a testing kit, had one friend who also used one. Her friend regularly sold ecstasy to her

and her friends, and he tested it before he sold it. On the other hand, none of the other participants could confirm if their friends used or owned testing kits. Two participants thought their friends *might* own them, but they were unsure. For instance, Laura thought one friend might own a testing kit due to the frequency of his or her drug use:

> MC: What strategies do your friends use to minimize potential harms caused by ecstasy?
> Laura: I don't think they use anything. They probably check with friends. I think maybe one friend might have a kit because they're just- they use drugs that often that they might.
> MC: So you think they might have one?
> Laura: Yeah but I think that's the extent.

Considering Laura had not heard of testing kits prior to the interview, she was just assuming her friend might use one based on his or her heavy drug use; she had not discussed testing kits with her friends nor seen them use them.

As for the other seven participants, they felt confident that none of their friends used testing kits. Ashley thought testing kits were uncommon amongst ecstasy users in general: "Of all the people I know that do ecstasy, which is a lot of people, none of them have any idea about the purity. It's just whether it works for you or not, and nobody has testing kits." As she told me this, she emphasized that "nobody" had testing kits, suggesting that using them was not a normal practice. Furthermore, Marg would feel uncomfortable using a testing kit because her friends did not use one: "If a bunch of people are doing it I'm not going to be like, 'oh guys just wait I have to go get this tested' and they'll be like, 'come on we're all taking it." She thought her friends would pressure her to not use a testing kit because they did not use one. Overall, using testing kits was an uncommon practice amongst the participants and their peers.

***Laboratory Services***

I asked each woman if she utilized an ecstasy testing laboratory to determine ecstasy purity because I learned about this strategy during my literature review. However, none of the

participants used laboratory services to determine the contents of their ecstasy because they did not know it was an option for them. Five participants made facial expressions that suggested they were surprised when I asked them about their experience using ecstasy testing laboratories because they did not know these laboratories existed. These participants raised their eyebrows, widened their eyes, or lowered their jaws. For example, when I told Dayna about laboratories that test ecstasy, she paused, raised her eyebrows and told me, "Honestly, I didn't know that that was an option really. I don't really know how that works, so… I guess I'm not educated about that." While Dayna had heard about testing kits before, she did not know about laboratory services.

Dayna and the other participants asked questions about this service, including information on the cost, anonymity of submitting ecstasy samples, and if the lab would return the samples to them. Taryn, the only participant who owned a testing kit, said she wanted to gather more information on this service:

> MC: Have you ever got your ecstasy tested by a laboratory where you can mail it in and get it analyzed?
> Taryn: No, I haven't. That's interesting though.
> MC: It takes some time though; it takes like a month.
> Taryn: Does it? I would look into that though because I'd be curious.

While Dayna also expressed interest in this service by asking questions about it, when I told her the length of time it took to receive test results, she was discouraged: "I think I probably wouldn't do that… I just think the time that it takes you'll probably- most people don't plan that far in advance." Since the lab test results take a few weeks, she probably would not use this service. Overall, participants did not utilize ecstasy testing laboratories. Instead, they used the four aforementioned strategies to try to determine the contents of their ecstasy.

# Chapter 4: Discussion and Summary

In Chapter 4, I discuss and summarize the results of my quantitative and qualitative analyses. This chapter is divided into four sections: First, I summarize my findings in regards to my research questions. Second, I explain the limitations of my research. Third, I outline the implications of my research. Last, I discuss my recommendations, including ideas for future research.

## 4.1 Summary of Results

In this section, I highlight my findings in regards to three research questions: 1) *Do ecstasy users think impure ecstasy poses a risk to their health? Why or why not?* 2) *What strategies do ecstasy users utilize to determine the purity of their ecstasy?* (e.g. testing kits, laboratories). 3) *Why do ecstasy users choose these strategies*? (e.g. ease of access). I answer these questions based on the information I gathered during 10 semi-structured interviews with female recreational ecstasy users, and the data I analyzed about 69 recreational ecstasy users in Victoria collected in the *Canadian Recreational Drug Use Survey (CRDUS)*.

Question 1: Do ecstasy users think impure ecstasy poses a risk to their health? Why or why not?

Three of the women I interviewed thought ecstasy users should be concerned about impure ecstasy; however, none seemed personally concerned about impurity. Overall, I believe the women that I interviewed did not think impure ecstasy was a risk to their health for four reasons. First, their ecstasy use patterns, in terms of their frequency of use, physical setting, and social setting, made them feel protected from harms related to ecstasy use. The women described themselves as "responsible," "recreational" ecstasy users with most using the drug once or twice per month. They controlled their ecstasy use to accommodate and balance their responsibilities, particularly schoolwork, and to protect their health. All participants used ecstasy during their

leisure time in particular physical settings, like music events, usually with a group of friends and sometimes boyfriends. When the women described their expectations for other ecstasy users regarding how often, how much, and in what setting they should use ecstasy, all of their own current ecstasy use patterns fit within the parameters they expected others to follow. This suggested that they felt their ecstasy use patterns were appropriate and would protect them from harms they perceived related to inappropriate ecstasy use, such as health problems.

Second, the women might not have been concerned about impure ecstasy harming their health because recreational ecstasy use was "normal" amongst young adults in Victoria who attended parties, raves, or clubs. The evidence for normalization comes from the three factors that I analyzed indicating if ecstasy use has become "normalized" in a specific location (Parker et al. 2002). Overall, the participants could easily access ecstasy in Victoria when they wanted, and they often received it from friends for free. They also believed ecstasy was a popular drug in Victoria, especially amongst their close friends. While the participants reported higher proportions of ecstasy use amongst their close friends than their friends and acquaintances, most of the women knew or assumed that at least some of their acquaintances and friends used ecstasy regularly too. Their estimates for the proportion of ecstasy use amongst these latter two groups might have been even higher if they had more details of these people's personal lives.

Furthermore, the women perceived recreational ecstasy use to be accepted by all ecstasy users, and the majority of their ecstasy-abstaining friends, close friends, and acquaintances, mainly because it was a common activity performed by groups of people, especially at parties, clubs, and raves. However, ecstasy users and abstainers only approved of ecstasy use if the ecstasy user was using the drug "appropriately." Overall, the participants expected ecstasy users to monitor the amount and frequency they used, use it with other people, and use it in specific settings, such as parties, because this would ensure they avoided "dangerous" situations. If an

individual was using "too much" ecstasy, using it too frequently, or in an inappropriate context, such as using it at work or alone, then this would cause concern because the person would be "throwing their life away" and damaging their health. As a result, this "problematic" use could potentially damage friendships.

Third, the women trusted their primary sources of ecstasy: their friends. The women usually obtained ecstasy and information about ecstasy, including purity information, from their friends whom they trusted. Since they trusted their friends and assumed their friends had experiential knowledge of the ecstasy, they often felt confident their friends were giving them pure or "good" ecstasy without questioning the accuracy or source of this information.

Finally, the women might not have been concerned about impure ecstasy harming their health because, to their knowledge, they had not suffered significant or long-term harm caused by impurity. While all of the women surmised they had ingested impure ecstasy in the past, only two reported that they had a resulting negative experience. Moreover, the harms they experienced were temporary and did not deter them from using ecstasy in the future. In addition, none of the women knew anyone who had experienced harms from ingesting impure ecstasy. The women's personal experiences, and their peers' experiences, appeared to shape their perceptions of ecstasy use and its potential harms. Since the women perceived impure ecstasy to be a common phenomenon, but they and their peers had not experienced significant harms, they had low risk perceptions regarding impurity.

Question 2**:** What strategies do ecstasy users utilize to determine the purity of their ecstasy?

The women used one or more of these strategies in an attempt to determine their ecstasy's purity or quality (i.e. "good" versus "bad"): discussed ecstasy with friends, analyzed the effects caused by their ecstasy, assessed the physical characteristics of their ecstasy, and used a testing

kit. While I asked how they determined the "purity" of their ecstasy, some participants clarified that they used strategies to decide if their ecstasy was "good" or "bad"; "good" ecstasy caused desirable effects, and "bad" ecstasy caused undesirable effects or no effects.

The most common strategy was discussing ecstasy with friends, particularly talking about its expected effects, its quality, and if it contained MDMA or not. In addition, five women analyzed the effects they felt while they were under the influence, or afterwards, to gather information about their ecstasy. While this strategy informed their perceptions regarding if their ecstasy and the batch it came from was pure or "good," they could only use this approach after they had ingested the ecstasy and experienced its effects. Furthermore, four participants examined their ecstasy's texture, colour, and/or form before they consumed it to try to determine its contents. Finally, one woman used and owned a testing kit: a Marquis Reagent® Testing Kit that she ordered online.

The data I gathered during the interviews about strategies for determining purity echoed the results of my statistical analysis of the CRDUS data in regards to the role that friends and testing kits played in determining purity. For instance, three-quarters of CRDUS participants discussed ecstasy purity with friends, making it the most popular strategy for minimizing harms caused by ecstasy, while usage and ownership of testing kits was uncommon. The results of my interviews also showed the popularity of talking to friends about ecstasy and the rarity of testing kits. I had no data on whether or not CRDUS participants assessed the physical characteristics of their ecstasy or analyzed its effects because the survey questions did not ask participants if they used these strategies; however, it is possible that some of them did. Likewise, the survey questions did not ask participants if they utilized laboratory services to test their ecstasy. I asked the women I interviewed if they had used this strategy because it is an accurate strategy

compared to other strategies to determine the contents of ecstasy (Winstock et al. 2001), but none of them had accessed this service.

Furthermore, I inquired about the women's experiences using websites and harm reduction services since the CRDUS collected information on participants' use of these resources. My analysis of the CRDUS data revealed that about one-third of ecstasy users checked drug information on websites and 3% of participants obtained advice from harm reduction services in order to avoid harms from ecstasy use. A few women I interviewed had used websites and blogs to learn about the side effects of ecstasy use, and this information sometimes informed their perceptions about what effects pure ecstasy should cause. However, none used these online resources with the intention to directly determine the purity of their ecstasy. As for harm reduction services, the woman who owned a testing kit accessed the harm reduction organization, ANKORS, to gather information on testing kits, but none of the other women had accessed harm reduction services to gain information about ecstasy or harm reduction resources for ecstasy use.

Question 3: Why do ecstasy users choose these strategies?

The women chose to discuss ecstasy with their friends to learn if it was pure or "good" because it was a convenient, practical strategy since they were usually with their friends while using ecstasy. Not only did these friends offer support and comfort while the participants were under the influence, but they also frequently provided the ecstasy. This exchange of ecstasy created an avenue for dialogue, so friends often exchanged information about the ecstasy during the transaction. Most participants felt comfortable getting this information from friends because they trusted their friends and, as a result, they trusted the information their friends provided them. They also assumed their friends had tried ecstasy from the same batch so they would have

experiential knowledge of it. These beliefs sometimes made the women consume ecstasy without questioning if the information their friends gave them was correct.

Furthermore, half of the women analyzed the physical and emotional effects that their ecstasy caused because they believed different chemicals caused different effects. Some participants described the effects of ingesting ecstasy that contained "speed" or "meth," while others simply talked about the effects of ingesting ecstasy that was "bad" or "not pure" without identifying what chemicals they thought it contained. They tended to use colloquial language to describe the effects they felt, such as "high" "gross," and "weird." Their beliefs regarding what effects "good" or pure ecstasy should cause were informed by talking to their friends and reading websites and blogs that discussed the effects of MDMA. In general, they expected "good" or pure ecstasy to generate desirable effects, such as euphoria, and "bad" ecstasy to create undesirable effects, such as nausea, or no effects at all. By analyzing these effects, they determined the contents of their ecstasy and decided if they wanted to ingest ecstasy from the same batch in the future.

In addition, some women assessed their ecstasy's physical characteristics before they ingested it because they believed the characteristics, specifically the texture, colour, and form of the ecstasy, could reveal its contents. This belief was based on information they learned from word-of-mouth via their friends as well as from their previous experiences using ecstasy. When they ingested ecstasy, they would associate the effects they experienced with the ecstasy's physical characteristics. Then, they used this information in the future to decide the purity or quality of their ecstasy, and in some cases, whether or not they would ingest it.

I used Ajzen's (2008) Theory of Planned Behaviour as a framework to understand the women's use of ecstasy testing kits because this model can explain why individuals perform a specific behaviour, such as using a testing kit. According to the Theory of Planned Behaviour, a person's *intention* to use a testing kit determines if a person will actually use it, and there are

three factors that predict an individual's intentions: the person's attitude towards using testing kits, perceived behavioural control of a testing kit, and subjective norms. In addition, an individual's *actual* behavioural control influences if he or she will be able to use a testing kit (Ajzen 1991; Ajzen 2008; Ajzen and Albarracin 2007).

Overall, this model gave me insight into why Taryn used a testing kit and the other women did not**.** During my interviews, I gathered information on these factors by asking the women about their attitudes or opinions of testing kits; I learned about their past experiences and barriers to using testing kits; and I assessed their peers' use of testing kits to help me understand the participants' subjective norms.

Taryn, the only participant who had used a testing kit, was exposed to testing kits for the first time at the ANKORS tent at the Shambhala Music Festival, and shortly after the music festival she ordered one online. Her decision to purchase one and start using it regularly was influenced by her interest in chemistry, as well as the negative experience she previously endured when she consumed "too much" ecstasy. Even though Taryn thought testing kits had flaws, particularly how they provided subjective results and could not accurately identify the presence of multiple chemicals in an ecstasy sample, she believed they could potentially protect her against ingesting impure ecstasy because they were "scientific" and could identify ecstasy that contained chemicals with a clearly different chemical reaction than that produced by MDMA. For these reasons, she thought testing kits were the best available strategy for determining ecstasy purity, and they could bring ecstasy users "a step closer to knowing what [they] have."

Taryn perceived the use of testing kits to be uncommon and she did not feel social pressure to use one. After she purchased her testing kit she discovered that one of her friends used one also, but she did not know anyone else who used one. While her subjective norms did not seem to play a factor in her intention to use a testing kit, the other two factors did: She had a

positive opinion of testing kits and she did not identify any barriers that deterred her from using them. Therefore, her attitude towards testing kits and perceived behavioural control might have influenced her intention to purchase and regularly use a testing kit, and her actual behavioural control allowed her to do so.

Overall, most of the women who did not use testing kits had positive opinions of them because they surmised that testing kits could help protect ecstasy users from ingesting impure ecstasy and that they would provide more accurate results than the current strategy they used because they were more "scientific" and "specific." However, three women thought testing kits were "unnecessary" for recreational ecstasy users like themselves, suggesting they had a somewhat negative attitude towards them. Dayna explained she "probably should've bought a testing kit" when she started using ecstasy regularly, but she chose not to; however, she did express interest in potentially using one in the future. On the other hand, Mandy and Emily, who explicitly stated they were not concerned about ecstasy impurity, had never considered using testing kits and did not plan to use them in the future. Perhaps their lack of concern regarding impurity also shaped their view of testing kits as "unnecessary."

Furthermore, I identified multiple barriers that potentially intervened with the women's perceived and actual capability to use testing kits. First, they lacked information about them, especially regarding their cost and how to access them. Second, testing kits were only sold online, which the women found inconvenient because they questioned the quality of online products and the confidentiality of online purchases. Third, they lacked exposure to them because testing kits were not advertised or sold in stores. These barriers made the women feel like they could not access testing kits, even if they wanted. In some cases, these barriers might have limited their actual behavioural control as well. For instance, the women who had never heard of testing kits could not use them because their lack of knowledge made it impossible for them to do so.

Finally, none of the participants who did not use testing kits could confirm if any of their peers used them. While two women assumed a friend might use a testing kit, others were confident that nobody they knew used one. One participant even perceived social pressure to avoid using a testing kit: Since none of her friends used one, she thought they might try to convince her to not use one if she tried. Overall, the women lacked social pressure to use testing kits, multiple barriers negatively influenced the women's perceived behavioural control, and three of them held negative attitudes towards testing kits. These factors hindered their intention to use testing kits and they experienced barriers that limited their actual behavioural control. As a result, they did not use this strategy to determine the contents of their ecstasy.

I also gathered information on participants' use of ecstasy testing laboratory services to determine ecstasy purity. We did not discuss this strategy as in-depth as testing kits because my goal was to learn only if they utilized this service. I discovered that none of the women used laboratory services because they did not know there was a laboratory that could test the contents of their ecstasy. While this lack of knowledge was a major barrier to them using this strategy, another potential barrier was the length of time an individual must wait for the results of the analysis.

### 4.2 Limitations

In this section, I discuss my study limitations in regards to my data and my use of the concept, *normalization.* In the first regard, there are two limitations to my statistical and interview data. First, participants were obtained using purposive sampling: a non-probability sampling technique. This means that while the statistical analysis and interviews revealed valuable information regarding groups of recreational ecstasy users in Victoria, the findings cannot be generalized to other populations, and might not represent the perceptions and behaviours of other ecstasy users.

Second, the data collected in the CRDUS and in my interviews were self-reported, so I cannot confirm that the information provided was completely accurate. For example, two interview participants reported they had experienced short-term harm from ingesting impure ecstasy; however, it can be difficult to know if negative experiences are the result of ecstasy impurity or other factors, such as dosage, level of hydration, and ambient temperature (Kolbrich et al. 2008; Parrott 2006; Parrott et al. 2006). For this reason, I cannot confirm how many of these women had consumed impure ecstasy nor had negative experiences from it.

While I viewed the CRDUS data and the data I collected during the interviews as factual, participants might have been dishonest with some of the information they provided. For instance, since I asked the interview participants about a sensitive topic, illegal drug use, social desirability bias could have occurred. This means the women might have under-reported their ecstasy use and the harms they experienced from it and over-reported behaviours they thought I would perceive to be desirable, such as trying to determine the purity of their ecstasy, because they wanted me to believe they acted in a "socially desirable" way so I would not judge them (Krumpal 2013). For example, participants might have said they would consider using testing kits in the future because I asked several questions about testing kits and why they do or do not use them. These questions might have suggested that I expect them to use testing kits. Similarly, the three women who mentioned ecstasy impurity in their list of concerns regarding ecstasy use might have done this because they thought I would want or expect them to be concerned about it.

Since social desirability can occur in interviews, I did my best to avoid it by reminding participants that their answers were confidential and anonymous, and asking questions in a neutral, non-judgmental way (Krumpal 2013:2036). If I had used an alternative data collection method, such as a self-administered survey, that does not require the presence of a researcher, I could have removed this potential problem. However, using face-to-face semi-structured

interviews was the best choice for my study because it allowed me to guide and encourage participants to speak about specific topics, ask additional questions based on their answers, and clarify questions that participants did not understand. Likewise, during administration of the CRDUS, the researcher who is present clarifies questions that the participant does not understand and the researcher enters the answers in the correct pattern and format, which avoids data entry errors. For these reasons, I believe the presence of a researcher during the surveys and the interviews resulted in collection of highly accurate, valuable data.

Furthermore, while the concept of *normalization* helped me understand ecstasy use amongst the participants and their peers who attended parties, raves, or clubs, there are limitations to using this concept in my study. I only collected data on three of the five factors that Parker and colleagues (2002) believe indicate if ecstasy use has become "normalized." I collected data on *rates of regular ecstasy use, accessibility,* and *acceptance of sensible ecstasy use,* but I did not assess *cultural accommodation of ecstasy use* or *rates of trying ecstasy*. Considering my project was constrained by time and funding, I decided to eliminate the factor of *cultural accommodation* because it would require me to analyze multiple sources of data, such as political discussions about the decriminalization of ecstasy and the depiction of ecstasy use in movies, magazines, and music, in order to understand if ecstasy use was culturally accommodated (Parker et al. 2002). I did not assess *rates of ecstasy trying* because I did not ask the appropriate questions to elicit this information. When I realized halfway through my interviews that I did not ask the participants specifically about rates of ecstasy *trying* amongst their peers, I decided to continue just collecting data about the rates of regular ecstasy use. Luckily, since people who regularly use ecstasy have technically tried it, I believe this factor informs the other.

Furthermore, there are limitations to assessing the three factors that I studied. First, I asked participants questions about their peers' use of ecstasy to assess the factor of *rates of*

*regular ecstasy use;* however, this factor is supposed to assess if there is a high rate of regular ecstasy use amongst people of various socio-economic statuses and genders because this can indicate normalization. Since I did not collect this type of information about the participants' peers, I cannot prove or disprove if there is a high rate of ecstasy trying amongst their peers who have different socio-economic statuses and genders. In addition, the information I obtained regarding rates of regular ecstasy use was based on the participants' perceptions and estimates, so I cannot confirm its validity.

Second, the factor regarding the *acceptance of sensible ecstasy use* is supposed to include acceptance by ecstasy users and ecstasy abstainers. Since I did not interview ecstasy abstainers, I gathered information on ecstasy abstainers' acceptance of sensible ecstasy use by asking the participants about these individuals' comments, behaviours, and opinions regarding ecstasy use. I also assessed the acceptance of ecstasy use by the women's ecstasy-using peers by asking the women about these individuals' comments, behaviours, and opinions. As a result, this information is based on the participants' perceptions, so I cannot confirm the accuracy of this information. However, their perceptions give a general idea of their peers' ecstasy use patterns and opinions of ecstasy use.

Third, I used the concept of *normalization* to study a small group of ecstasy users at one point in time; however, Parker and colleagues (2002:959) believe normalization can only be "comprehensively assessed" by studying the factors that are indicative of normalization long-term, which would require a longitudinal study. For this reason, I cannot confirm if ecstasy use is, or is becoming, normalized amongst young adults in Victoria who attend raves, parties, or clubs using my cross-sectional data; I can only reveal if my study shows general support for or against normalization based on the perceptions of a small group of female recreational ecstasy users.

### 4.3 Implications

Despite the caveats I discussed above, the data I collected on ecstasy use are valuable for several reasons. First, my research contributed to the drug literature by collecting data on ecstasy users' risk perceptions of harms caused by impurity, the potential normalization of ecstasy use amongst young adults in Victoria who attend parties, clubs, or raves, and strategies for determining ecstasy purity. In addition, the information I obtained during my interviews with female recreational ecstasy users helped address the "gender imbalance" in the drug literature (Hinchliff 2001:455). By sharing ecstasy use behaviours and experiences of these women, I contributed to the literature on substance use by women in non-clinical settings, an area neglected in the past (Ettorre 1992:2). In addition, I added to the drug literature by applying the Theory of Planned Behaviour to the practice of using ecstasy testing kits. While previous studies applied the Theory of Planned Behaviour to ecstasy use, researchers have not applied this model to the use of ecstasy testing kits (Peters et al. 2007). Overall, the data I added to the drug literature can help inform future research and harm reduction approaches aimed at ecstasy use.

Unfortunately, unbeknownst to ecstasy users, "ecstasy" pills and powder sometimes contain highly toxic, life threatening chemicals (Canadian Centre on Substance Abuse 2015; Health Canada 2015b). For this reason, it is essential to understand ecstasy users' risk perceptions of ecstasy impurity, how they determine the contents of their ecstasy, and why they choose these strategies because this information can help researchers plan harm reduction approaches that protect ecstasy users from the dangers of ecstasy impurity. The data I collected on the women's risk perceptions of ecstasy impurity are valuable because we must understand ecstasy users' perceptions of ecstasy impurity to understand the strategies they use to determine purity, or lack thereof. Also, in order to change the risk perceptions of ecstasy users and make them aware of the risks of impure ecstasy, we must understand the reasons behind their low risk perceptions.

Previous studies found ecstasy users associate harms, such as hyperthermia, with using ecstasy. As such, it cannot be perceived to be a "harmless" drug (for example, see Carlson et al. 2004; Gamma et al. 2005). However, in regards to ecstasy impurity, most of the women I interviewed did not seem personally concerned about ingesting impure ecstasy and experiencing harm. Perhaps this was because they were "recreational" and responsible" users. They also appeared to have low risk perceptions of ecstasy impurity because they had not experienced serious or long-term harms that they associated with the ingestion of impure ecstasy, even though they assumed they had consumed impure ecstasy in the past. While individuals might believe ecstasy can cause harms, if they do not personally experience a problem they will have low risk perceptions of using ecstasy (Gamma et al. 2005).

In addition, the women primarily obtained ecstasy and information about ecstasy from their friends, which is a common practice amongst ecstasy users (Parker et al. 2002). Like Jacinto and colleagues' (2008) participants, some of the women I interviewed cited "trust" as a reason for obtaining ecstasy information, including information about purity, from friends. Since "trust" can lower individuals' risk perceptions of certain behaviours (Tulloch 1998), perhaps the trust that the women had for their friends made them feel confident that the ecstasy they were receiving from them was harmless and the information their friends provided them was accurate.

Furthermore, the information I obtained during the interviews showed general support for normalization of ecstasy use amongst young adults in Victoria who attend parties, raves, or clubs. While researchers have studied normalization of ecstasy use in various geographic locations, including Canada (see Cristiano 2014), they have not studied it in regards to young adults in Victoria who attend parties, raves, or clubs. Not only does my research add to the literature on normalization, but also my application of this concept may help explain the women's low risk perceptions of impure ecstasy. When individuals perceive ecstasy use to be a "normal" aspect of

their lives, they tend to have low risk perceptions of ecstasy use (Bahora et al. 2009; Parker et al. 2002; Parker 2004). The potential normalization of ecstasy, paired with the women's past experiences, trust for their friends, and ecstasy use patterns could be why they were not personally concerned about harms related to impurity.

This study also showed that ecstasy users utilize strategies that are potentially inaccurate, and which could put ecstasy users at risk if they are not aware of their limitations. Similar to previous studies (for example, see Johnston et al. 2006), the primary strategy that the CRDUS participants and the women I interviewed utilized to determine the contents of their ecstasy was to discuss it with their friends. While their friends might be trustworthy and have experiential knowledge of ecstasy from the same batch, they could also provide inaccurate information since their experiences and opinions are subjective (Johnston et al. 2006:470). Similarly, information that the women gathered by assessing the physical characteristics of their ecstasy and analyzing the effects was dependent on their own opinions, experiences, and expectations, so it was potentially inaccurate.

I also gathered valuable data on testing kit use. Although testing kits have limitations (for example, see Winstock et al. 2001), they can potentially protect ecstasy users from ingesting impure ecstasy, as long as ecstasy users are properly informed about their proper use and limitations. My study supported previous findings that the use of testing kits was uncommon (for example, see Johnston et al. 2006); however, my research went a step further and provided in-depth details about *why* ecstasy users do not use testing kits. The women's lack of knowledge about testing kits, their lack of exposure to them, and the fact that testing kits are only sold online were all barriers that researchers and harm reduction organizations can address. By recognizing and removing these barriers, ecstasy users might be more likely to use testing kits. My study supported this by showing that the majority of the women I interviewed expressed some interest

in learning more about testing kits or possibly using them in the future, if these barriers were addressed.

Similarly, my research of ecstasy users' use of laboratory testing services revealed barriers that might prevent ecstasy users from utilizing this service. In regards to the women I interviewed, they did not even know this service existed. Since this strategy is more accurate than the ones that my participants utilized, including testing kits (Winstock et al. 2001), I believe ecstasy users should consider using it. Certainly it is not the most convenient strategy given time and cost restraints. However, if ecstasy users are informed about laboratory testing services and they feel this strategy is accessible to them, then at least it is an option they can consider.

**4.4 Recommendations and Future Research**

Based on my research findings, I offer several recommendations that address barriers to using testing kits in order to increase their use. As a result, ecstasy users would have an extra layer of protection against impure ecstasy because they could potentially identify if their ecstasy contains toxic substances in lieu of MDMA. Since sharing drug information amongst friends is so popular (for example, see Hansen et al. 2001), if ecstasy users utilize testing kits, it is likely that they will share the test results with their friends (Dowden and Michelow 2015:13), along with other information, such as the ecstasy's effects. If individuals can identify "bad" or impure ecstasy with their testing kits, they might prevent their friends from ingesting it. Therefore, even a slight increase in the use of testing kits could have a profound impact and expansive reach within ecstasy-using social groups, even protecting those users who believe testing kits are "unnecessary".

To achieve this goal, testing kits should be sold in stores as opposed to only online because this would make it easier for ecstasy users to purchase them. They would not have to

worry about purchasing fraudulent items from the Internet, having to use their credit card to make the purchase, or getting the testing kit delivered to their residence. Secondly, testing kits should be advertised by a variety of sources. While the sale of testing kits in stores should result in more ecstasy users being exposed to them, advertisements, such as billboards, posters, and radio advertisements, can increase exposure and awareness of testing kits by providing information on their cost, purpose, and how to purchase them. Advertisements should also include information about their limitations, so individuals can make informed decisions about using testing kits.

Thirdly, event organizers should support and advocate for the presence of harm reduction organizations at music festivals, including organizations that provide ecstasy testing services, such as ANKORS. Although music festivals tend to have "no drug" policies, festival attendees still smuggle in ecstasy, sell or exchange it, and use it at these locations. As a result, sometimes festival attendees ingest impure ecstasy and suffer illness or death (Lund and Turris 2015; Ridpath et al. 2014). By providing ecstasy testing services at music festivals, festival attendees have the opportunity to determine the contents of their ecstasy before they ingest it. In addition, festival attendees can gather information about this harm reduction strategy. Also, if ecstasy users witness their peers testing their ecstasy, then perhaps this will change their subjective norms of using testing kits, and this will make them more likely to perform this behaviour as well. Considering hundreds of individuals have accessed the pill and powder testing service at the ANKORS booth at the Shambhala Music Festival (Dowden and Michelow 2015), including Taryn, the only woman I interviewed who used a testing kit, this suggests ecstasy users who are presented with this option, might utilize it.

Finally, I offer two suggestions for future research. First, researchers should study ecstasy users' utilization of ecstasy testing laboratories, including the determinants for using this service. My study only collected preliminary data on this topic. By applying the Theory of Planned

Behaviour to the use of ecstasy testing laboratories, researchers can identify barriers that prevent individuals from using them. For instance, my study suggested that a barrier preventing ecstasy users from testing their ecstasy in laboratories was a lack of knowledge about them. There could be other major barriers as well. Since this technology is more accurate than testing kits (Winstock et al. 2001), it would be advantageous to identify these barriers so they can be addressed.

Second, researchers should perform longitudinal studies of the normalization of recreational ecstasy use amongst individuals in Victoria who attend parties, raves, or clubs because this would allow for a more detailed analysis of normalization (Measham et al. 2011; Parker et al. 2002). Although my study was based on a small sample, utilized cross-sectional data, and only analyzed three of the indicators of normalization, the results give reason to study this topic in more depth. By performing a longitudinal study that includes individuals with various socioeconomic statuses and genders, researchers could gather more data on ecstasy use behaviours and normalization amongst this cohort, which, in turn, could help researchers understand ecstasy users' risk perceptions of impurity and the strategies that they use to protect themselves from this harm.

## Chapter 5: Conclusion

Ecstasy, an illegal and unregulated synthetic drug, sometimes contains chemicals besides MDMA. These chemicals can be toxic and sometimes cause health problems when ecstasy users ingest them. This serious problem inspired me to examine the strategies that ecstasy users in Victoria, British Columbia utilize to determine ecstasy purity. I also studied the reasons why they choose these strategies and if they think impure ecstasy poses a risk to their health because this information can help explain the use of these strategies. I utilized a mixed methods approach consisting of quantitative data analysis of cross-sectional survey data followed by semi-structured interviews. These methods complemented each other: While the survey data provided a template for my interview guide questions, the qualitative interview data enhanced my understanding of the quantitative data. As a result, I gathered valuable information that helped me address my research questions.

My statistical analysis of CARBC's CRDUS data revealed the strategies that recreational ecstasy users utilized to minimize potential harms associated with ecstasy. Most participants reported they discussed ecstasy purity with friends (73.9%). Other strategies included checking drug information websites (33.3%), using an ecstasy testing kit (17.4%), and asking harm reduction services for advice (2.9%). Nobody owned a testing kit (0%). The results also showed that participants were more likely to take ecstasy from a friend than a stranger, even if they did not know who or where their friend got it. The subsequent interviews that I conducted with recreational ecstasy users offered possible interpretations for these survey data.

The 10 interviews that I conducted allowed me to give a voice to female recreational substance users, a group who have been underrepresented in the drug literature in the past. These interviews also allowed me to gather in-depth information about recreational ecstasy users' experiences and opinions on a variety of topics, including history of ecstasy use, patterns of

ecstasy use, concerns and harms related to ecstasy use, ecstasy purity, and strategies for determining purity.

I discovered that all participants used one or more of the following strategies to determine the purity or quality (i.e. "good" or "bad") of their ecstasy: discussed ecstasy with friends, analyzed the effects caused by their ecstasy, assessed the physical characteristics of their ecstasy, and used a testing kit. The emphasis on discussing ecstasy with friends and the unpopularity of using or owning a testing kit aligned with the results of my statistical analysis.

During the interviews, I was able to ask participants *why* they chose certain strategies instead of others. I learned that the women preferred to discuss ecstasy with friends to determine purity because they were usually with their friends when using ecstasy. Therefore, this was a practical and convenient strategy to gather information. Furthermore, the women often received ecstasy from friends, and this exchange of ecstasy was often paired with an exchange of information about the ecstasy. Most participants believed the information their friends provided them because they trusted their friends, and they also assumed their friends had experiential knowledge of the ecstasy they were giving them. As a result, sometimes the women consumed ecstasy without questioning the accuracy of the information their friends provided them.

Another strategy that some women used to determine purity was to assess the ecstasy's physical characteristics, particularly its texture, colour, and form. Their beliefs regarding the appearance of "good" or pure ecstasy shaped their perceptions of the contents of their ecstasy. In addition, half the women analyzed the physical and emotional effects they felt after ingesting ecstasy to determine purity. They formed beliefs regarding what chemicals were in their ecstasy, by reflecting on their own experiences and using information they had gathered by a variety of sources, including talking to their friends. In regards to ecstasy testing kits, only one participant used or owned one. By applying the Theory of Planned Behaviour to the women's use of testing

kits, I gained insight into why the others did not. The sole ecstasy user had a positive opinion of testing kits and did not perceive any barriers to using a testing kit. On the other hand, the other women identified multiple barriers to using testing kits: they had a paucity of information about them, the kits were only for sale online, and they were not regularly exposed to them. In addition, some participants perceived testing kits to be "unnecessary" and they did not feel social pressure to use them. As a result, they lacked intention to use testing kits and, in some cases, they did not have actual behavioural control to use them. This prevented them from using testing kits.

While all participants had experience assessing their ecstasy's purity or quality using one or more of these strategies, the women I interviewed did not seem personally concerned about ecstasy impurity posing a risk to their health. I believe their low risk perceptions can be explained by four factors. First, they only used ecstasy during their leisure time and in particular physical and social settings. These patterns of ecstasy use made them feel like "recreational" and "responsible" ecstasy users who were safe from harms associated with ecstasy. Second, they had not suffered significant harm caused by impure ecstasy, even though they all surmised they had ingested it previously. Third, they primarily received ecstasy and ecstasy information from a trusted source: their friends.

Fourth, the women might not have been concerned because recreational ecstasy use was an accepted and "normal" behaviour amongst young adults in Victoria who attended parties, raves, or clubs. My evidence for this came from applying Parker and colleagues' (2002) concept of *normalization*. I found the women could easily access ecstasy in Victoria, and they perceived ecstasy was a commonly used drug, especially amongst their close friends. They also believed ecstasy users and ecstasy abstainers accepted ecstasy use, as long as individuals used it "appropriately" in regards to the amount, frequency, and context of use.

My findings are valuable because understanding the factors that shape ecstasy users' low risk perceptions of ecstasy impurity might allow researchers to change these risk perceptions. Also, interpreting ecstasy users' risk perceptions can help researchers understand the reasons behinds ecstasy users' use or disuse of particular strategies, like ecstasy testing kits, laboratory services, and discussing ecstasy with friends. I believe understanding how ecstasy users determine ecstasy purity and why they choose particular strategies instead of others will help researchers devise effective harm reductions strategies to protect ecstasy users from harms caused by impure ecstasy.

A vital first step would be to address the multiple barriers that prevent ecstasy users from utilizing ecstasy testing kits and laboratory services since these strategies can potentially help ecstasy users identify toxic chemicals in their ecstasy before they ingest it. Using these strategies could add an extra layer of protection for recreational ecstasy users in Victoria and other locations, and help them avoid harm caused by impure ecstasy.

## Works Cited


Agar, M., and M. Reisinger
2003 Going for the Global: The Case of Ecstasy. Human Organization 62(1):1-11.

Ajzen, Icek
1991 The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes 50(20):179-211.

2008 Theory of Planned Behavior. *In* Encyclopedia of Epidemiology. Sarah Boslaugh, ed. Pp. 1032-1034. Thousand Oaks: SAGE Publications.

2012 The Theory of Planned Behavior. *In* Handbook of Theories of Social Psychology. Collection: Volumes 1 & 2. Paul A.M. Lange, Arie W. Kruglanski, and E. Tory Higgins, eds. Pp 438-459. Thousand Oaks: SAGE Publications.

Ajzen, Icek, and Dolores Albarracin
2007 Predicting and Changing Behavior: A Reasoned Action Approach. *In* Prediction and Change of Health Behavior: Applying the Reasoned Action Apporoach. I. Ajzen, D. Albarracin, and R. Hornik, eds. Pp. 3-21. Mahwah, NJ: Lawrence Eribaum.

Allott, Kelly and Jennifer Redman
2006 Patterns of Use and Harm Reduction Practices of Ecstasy Users in Australia. Drug and Alcohol Dependence 82(2):168-176.

Antolino-Lobo, Irene, Jan Meulenbelt, Martin van den Berg, and Majorie B.M. van Duursen
2011 A Mechanistic Insight into 3,4-Methylenedioxymethamphetamine (‘‘ecstasy’’)-Mediated Hepatotoxicity. Veterinary Quarterly 31(4):193-205.

Baggott M., B. Heifets, RT. Jones, J. Mendelson, E. Sferios, and J. Zehnder
2000 Chemical Analysis of Ecstasy Pills. Journal of the American Medical Association 284(17):2190-2190.

Bahora, Masuma, Claire E. Sterk, and Kirk W. Elifson
2009 Understanding Recreational Ecstasy Use in the United States: A Qualitative Inquiry. International Journal Drug Policy 20(1):62–69.

Battaglia, Michael P.
2008 Nonprobability Sampling. *In* Encyclopedia of Survey Research Methods. Paul J. Lavrakasm, ed. Pp. 524-527. Thousand Oaks: Sage Publications.

Becker, Jürgen, Peter Neis, Jörg Röheich, and Siegfried Zömtlein
2003 A Fatal Paramethoxymethamphetamine Intoxication. Legal Medicine 5:S138-S141.

Benzenhofer, Udo, and Torsten Passie
2010 Rediscovering MDMA (Ecstasy): The Role of the American Chemist Alexander T. Shulgin. Addiction 105(8):1355-1361.

Bernard, H. Russell
2011 Research Methods in Anthropology: Qualitative and Quantitative Approaches. Fifth Ed. Lanham, Maryland: AltaMira Press.

Boeri, Miriam Williams, Claire E. Sterk, and Kirk W. Elifson
2004 Rolling Beyond Raves: Ecstasy Use Outside the Rave setting. Journal of Drug Issues 34(4):831-860.

Braun, Virginia and Victoria Clarke
2006 Using Thematic Analysis in Psychology. Qualitative Research in Psychology 3(2):77-101.

Bryman, Alan
2006 Integrating Quantitative and Qualitative Research: How is it Done? Qualitative Research 6(1):97-113.

Brunt, Tibor M., Maarten W. Koeter, Raymond J.M. Niesink, and Wim van den Brink
2012 Linking the Pharmacological Content of Ecstasy Tablets to the Subjective Experiences of Drug Users 220(4):751-762.

Burgess, C., A. O'Donohoe, and M. Gill
2000 Agony and Ecstasy: A Review of MDMA Effects and Toxicity. European Psychiatry 15(5):287-294.

Camilleri Andrew M., and David Caldicott
2005 Underground Pill Testing, Down Under. Forensic Science International 151:53-58.

Campbell, John L., Charles Quincy, Jordan Osserman, and Ove K. Pedersen
2013 Coding In-depth Semistructured Interviews: Problems of Unitization and Intercoder Reliability and Agreement Sociological Methods & Research 42(3):294-320.

Canadian Centre on Substance Abuse
2015 MDMA (Ecstasy, Molly). http://www.ccsa.ca/Resource%20Library/CCSA-MDMA-Drug-Summary-2015-en.pdf, accessed October 3, 2015.

Carey, James W.
1996 Intercoder Agreement in Analysis of Responses to Open-Ended Interview Questions: Examples from Tuberculosis Research. Cultural Anthropology Methods 8(3):1-5.

Carlson, Robert G., Jill A. McCaughan, Russel S. Falck, Jichuan Wang, Harvey A. Siegal, and Raminta Daniulaityte
2004 Perceived Adverse Consequences Associated with MDMA/Ecstasy Use Among Young Polydrug Users in Ohio: Implications for Intervention. International Journal of Drug Policy 15 (2004) 265–274.

Centre for Addictions Research of British Columbia
2015a "High-Risk Populations." http://www.uvic.ca/research/centres/carbc/projects/aod-monitoring/high-risk/index.php, accessed October 10, 2015.

2015b "Substance Use in High-Risk Populations in BC." http://www.uvic.ca/research/centres/carbc/stats/high-risk-populations/index.php, accessed October 3, 2015.

Cole, Claire, Lisa Jones, Jim McVeigh, Andrew Kicman, Qutub Syed, and Mark A. Bellis
2010 Cut. Liverpool: Centre for Public Health. http://www.cph.org.uk/wp-content/uploads/2012/08/cut-a-guide-to-the-adulterants-bulking-agents-and-other-contaminants-found-in-illicit-drugs.pdf, accessed October 3, 2015.

Conner, Mark, Kellie Sherlock, and Sheina Orbell
1998 Psychosocial Determinants of Ecstasy Use in Young People in the UK. British Journal of Health Psychology 3:295-317.

Cowan, Ronald L., Deanne M. Robers, and James M. Joers
2008 Neuroimaging in Human MDMA (Ecstasy Users). Annals of the New York Academy of Sciences 1139(1):291- 298.

Crilly, Nathan, Alan F. Blackwell, P. John Clarkson
2006 Graphic Elicitation: Using Research Diagrams as Interview Stimuli. Qualitative Research 6(3):341-366.

Cristiano, Nick
2014 Living in Ecstasy: Applying the Normalization Thesis in Canada. Journal of Substance Use 19(6):405-409.

Department of Justice
2014 Drug Enforcement Administration. Drug Scheduling. http://www.justice.gov/dea/druginfo/ds.shtml, accessed October 3, 2015.

DeWalt, Kathleen M., and Billie R. DeWalt
2011 *Participant Observation: A Guide for Fieldworkers*. Second Edition. Lanham: Altimira Press.

Dias da Silva, Diana and Helena Carmo
2013 The Risky Cocktail: What Combination Effects Can We Expect between Ecstasy and Other Amphetamines? Archives of Toxicology 87(1):111-122.

Douglas, Mary
1992 Risk and Blame: Essays in Cultural Theory. London: Routledge.

Dowden, Cheryl, and Warren Michelow
2015 "Start Small, Take it Easy:" Results from the ANKORS Harm Reduction Survey at the 2013 Shambhala Music Festival. Report. ANKORS.

Duff, Cameron
2005 Party Drugs and Party People: Examining the 'Normalization' of Recreational Drug use in Melbourne, Australia. International Journal of Drug Policy 16:161-170.

Duff, Cameron with Warren Michelow, Clifton Chow, Andrew Ivsins, and Tim Stockwell
2009 The Canadian Recreational Drug Use Survey: Aims, Methods and First Results. Contemporary Drug Problems 36:517-540.

Duterte, Micheline, Camille Jacinto, Paloma Sales, and Sheigla Murphy
2009 What's in a Label? Ecstasy Sellers' Perceptions of Pill Brands. Journal of Psychoactive Drugs 41(1):27-37.

EcstasyData
2013 "Contact Us." http://www.ecstasydata.org/contact.php, accessed October 3, 2015.

Erowid Centre
2012 "Projects." http://www.erowidcenter.org/projects/projects.php, accessed October 6, 2015.

Ettorre, Elizabeth
1992 Women and Substance Use. New Brunswick, New Jersey: Rutgers University Press.

2004 Revisioning Women and Drug Use: Gender Sensitivity, Embodiment and Reducing Harm. International Journal of Drug Policy 15:327-335.

2007 Revisioning Women and Drug Use: Gender, Power and the Body. New York: Palgrave MacMillan.

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
2003 Risk Assessments: Report on the Risk Assessment of PMMA in the Framework of the Joint Action on New Synthetic Drugs. http://www.emcdda.europa.eu.ezproxy.library.uvic.ca/attachements.cfm/att_33350_ EN_Risk5.pdf, accessed October 3, 2015.

Freudenmann, Roland W., Florian Oxler, and Sabine Bernschneider-Reif
2006 The Origin of MDMA (Ecstasy) Revisted: The True Story Reconstructed from Original Documents. Addiction History 101(9):1241-1245.

Gallagher, Ryan, Ronald Shimmon, and Andrew M. McDonagh
2012 Synthesis and Impurity Profiling of MDMA Prepared from Commonly Available Starting Materials. Forensic Science International 223(1):306-313.

Gamma, Alex, Lisa Jerome, Matthias Liechti, and Harry Sumnall
2005 Is Ecstasy Perceived To Be Safe? Drug and Alcohol Dependence 77:185-193.

Gourley, Michelle
2004 A Subcultural Study of Recreational Ecstasy Use. Journal of Sociology 40(1):59-73.

Green, A.R.; Mechan, A.O.; Elliott, J.M.; O'Shea, E. & Colado, M.I.
2003 The Pharmacology and Clinical Pharmacology of 3,4-methylenedioxymethamphetamine (MDMA, "ecstasy"). *Pharmacological Reviews* 55: 463–508.

Growing, Linda R., Susan M. Henry-Edwards, Rodney J. Irvine, and Robert L. Ali
2002 The Health Effects of Ecstasy: A Literature Review. Drug and Alcohol Review 21:53- 63.

Guest, Greg, Kathlenn M. MacQueen, and Emily E. Namey
2012 Applied Thematic Analysis. Thousand Oaks: Sage Publications.

Gwinnell, Esther, and Christine Adamec
2008 Methylenedioxymethamphetamine (Mdma/Ecstasy). *In* The Encyclopedia of Drug Abuse. Pp. 205-208. New York: Facts on File, Inc.

Hall, A.P. and L.A. Henry
2006 Acute Toxic Effects of 'Ecstasy' (MDMA) and Related Compounds: Overview of Pathophysiology and Clinical Management. British Journal of Anaesthesia 96(6):678-685.

Hansen, Dorthe, Bruce Maycock, and Tony Lower
2001 'Weddings, Parties, Anything...:' A Qualitative Analysis of Ecstasy Use in Perth, Western Australia. International Journal of Drug Policy 12:181-199.

Hansen, Emily C.
2006 Successful Qualitative Health Research. Berkshire, England: Open University Press.

Hartung, T.K., E. Schofield, A.I. Short, M.J.A. Parr, and J.A. Henry
2002 Hyponatraemic States Following 3,4-methylenedioxymethamphetamine (MDMA, 'ecstasy') ingestion. Quarterly Journal of Medicine 95:431-437.

Hayner, Gregory N.
2002 MDMA Misrepresentation: An Unresolved Problem for Ecstasy Users. Journal of Psychoactive Drugs, 34(2):195-198.

Health Canada
2015a "Canadian Tobacco, Alcohol and Drugs Survey, February – December 2013." http://healthycanadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/tables-tableaux-2013-eng.php, accessed October 3, 2015.

2015b "Ecstasy." http://healthycanadians.gc.ca/healthy-living-vie-saine/substance-abuse-toxicomanie/controlled-drugs-substances-controlees/ecstasy-eng.php, accessed October 3, 2015.

Henry, J.A., K.J. Jeffreys, and S. Dawling
1992 Toxicity and Deaths from 3,4-methylenedioxymethamphetamines ("ecstasy"). The Lancet 340:384-387.

Hinchliff, Sharron
2001 The Meaning of Ecstasy Use and Clubbing to Women in the Late 1990s. International Journal of Drug Policy 12(5-6):455-468.

Hunt, Geoffrey P., Kristin Evans, and Faith Kares
2007 Drug Use and Meanings of Risk and Pleasure. Journal of Youth Studies 10(1):73-96.

Hurley, R.A., Reneman, L., and Taber, K.H.
2002 Ecstasy in the Brain: A Model for Neuroimaging. Journal of Neuropsychiatry and Clinical Neurosciences 14 (2):125–129.

Jacinto, Camille, Micheline Duterte, Paloma Sales, and Shegla Murphy
2008 Maximising the Highs and Minimizing the Lows: Harm reduction Guidance within Ecstasy Distribution Networks. International Journal of Drug Policy 19:393-400.

Johnston, Jennifer, Monica J. Barratt, Craig L. Fry, Stuart Kinner, Mark Stoove, Louisa Degenhardt, Jessica George, Rebecca Jenkinson, Matthew Dunn, and Raimondo Bruno
2006 A Survey of Regular Ecstasy Users' Knowledge and Practices Around Determining Pill Content and Purity: Implications for Policy and Practice. International Journal of Drug Policy 17:464–472.

Kalant, H.
2001 The Pharmacology and Toxicology of Ecstasy: (MDMA) and Related Drugs. Canadian Medical Association Journal 165(7):917-928.

Kochana, J., A. Parczewski, and J. Wilamowski
2006 SPE/TLC Profiling of the Impurities of MDMA: The Influence of an Agglutinant, Diluents, and Adulterants. Journal of Liquid Chromatography & Related Technologies, 29(9):1247-1256.

Kohler, Hans-Peter, Jere R. Behrman, and Susan C. Watkins
2007 Social Networks and HIV/AIDS Risk Perceptions. Demography 44(1):1-33.

Kolbrich, Erin A., Robert S. Goodwin, David A. Gorelick, Robert Hayes, Elliot A. Stein, and Marilyn A. Huestis
2008 Physiological and Subjective Responses to Controlled Oral 3,4 Methylenedioxy-methamphetamine Administration. Journal of Clinical Psychopharmacology 28(4):432-440.

Krumpal, Ivar
2013 Determinants of Social Desirability Bias in Sensitive Surveys: A Literature Review 47(4):2025-2047.

Lapadat, Judith C.
2010 Thematic Analysis. *In* Encyclopedia of Case Study Research. Albert J. Mills, Gabrielle Durepos, and Elden Wiebe, eds. Pp.1-3. Thousand Oaks: Sage Publications.

Levinthal, C.
2008 Drugs, behavior, and modern society. Boston: Pearson Education Inc.

Lund, Adam, and Sheila A. Turris
2015 Mass-Gathering Medicine: Risks and Patient Presentations at a 2-Day Electronic Dance Music Event. Prehospital and Disaster Medicine 30(3):271-278.

Lupton Deborah, and John Tulloch
1998 The Adolescent 'Unfinished Body,' Reflexivity and HIV/AIDS Risk. Body & Society 4(2):19-34.

McMillan, Brian, and Mark Conner
2003 Applying an Extended Version of the Theory of Planned Behavior to Illicit Drug Use among Students. Journal of Applied Social Psychology 33(8):1662-1683.

Measham, Fiona
2002 'Doing Gender' – Doing Drugs. Conceptualizing the Gendering of Drug Cultures. Contemporary Drug Problems 298(2):335–373.

Measham, Fiona, and Michael Shiner
2009 The Legacy of 'Normalisation': The Role of Classical and Contemporary Criminological Theory in Understanding Young People's Drug Use. International Journal of Drug Policy 20:502-508.

Measham, Fiona, Lisa Williams, and Judith Aldridge
2011 Marriage, Mortgage, and Motherhood: What Longitudinal Studies Can Tell Us About Gender, Drug 'Careers' and the Normalization of Adult 'Recreational' Drug Use 22(6):420-427.

Murphy, Philip N., Michelle Wareing, and John E. Fisk
2006 Users' Perceptions of the Risks and Effects of Taking Ecstasy (MDMA): A Questionnaire Study. Journal of Psychopharmacology 20(3):447-455.

Miles, Matthew B., A. Michael Huberman, and Johnny Saldaña
2014 Qualitative Data Analysis: A Methods Sourcebook. Thousand Oaks: Sage Publications.

Minister of Justice
2015 Controlled Drugs and Substances Act. http://laws-lois.justice.gc.ca/eng/acts/c-38.8/, accessed October 3, 2015.

Nicol, Jennifer J.E., Mark C. Yarema, Graham R. Jones, Walter Martz, Roy A. Purssell, Judy C. MacDonald, Ian Wishart, Monica Durigon. Despina Tzemis, and Jane A. Buxton
2015 Deaths From Exposure to Paramethoxymethamphetamine in Alberta and British Columbia, Canada: A Case Series. Canadian Medical Association Journal 3(1): E83–E90.

O'Leary, Grace, Jessica Nargiso, and Roger Weiss
2001 3,4-methylenedioxymethamphetamine (MDMA): A Review. Current Psychiatric Reports 3(6):477-483.

Olsen, Anna
2009 Consuming E: Ecstasy Use and Contemporary Social Life. Contemporary Drug Problems 36(1-2):175-191.

Orbell, Sheina, Catherine Blair, Kellie Sherlock, and Mark Conner
2001 The Theory of Planned Behavior and Ecstasy Use: Roles for Habit and Perceived Control Over Taking Versus Obtaining Substances. Journal of Applied Social Psychology 31(1):31-47.

Padgett, Deborah K.
2012 Qualitative and Mixed Methods in Public Health. Sage Publications: Thousand Oaks.

Parker, Howard
2004 Normalization as a barometer: Recreational Drug Use and the Consumption of Leisure by Younger Britons. Addiction Research and Theory 13(3):205-215.

Parker, Howard, Lisa Williams, and Judith Aldridge
2002 The Normalization of 'Sensible' Recreational Drug Use: Further Evidence from the North West England Longitudinal Study. Sociology 36: 941-964.

Parrott, Andrew C.
2006 MDMA in Humans: Factors which Affect the Neuropsychobiological Profiles of Recreational Ecstasy Users, the Integrative Role of Bioenergetic Stress. Journal of Psychopharmacology 20(2):147-163.

2013 Human Psychobiology of MDMA or 'Ecstasy': An Overview of 25 Years of Empirical Research. Human Psychopharmacology 28(4):289-307.

2014 The Potential Dangers of Using MDMA for Psychotherapy. Journal of Psychoactive Drugs 46(1):37-43.

Parrott, Andrew C., J. Rodgers, T. Buchanan, J. Ling, T. Heffernan, and A.B. Scholey
2006 Dancing Hot on Ecstasy: Physical Activity and Thermal Comfort Ratings are Associated with the Memory and Other Psychobiological Problems Reported by Recreational MDMA Users. Human Psychopharmacology: Clinical and Experimental 21(5):285-298.

Pentney, Alana R.
2001 An Exploration of the History and Controversies Surrounding MDMA and MDA. Journal of Psychoactive Drugs 33(3):213-221.

Peters, Gjalt-Jorn, Gerjo Kok, and Charles Abraham
2007 Social Cognitive Detemrinants of Ecstasy Use to Target in Evidence-Based Interventions: A Meta-Analytical Review. Addiction 103:109-118.

Raviña, Paula, Jose Maria Quiroga, and Tomas Raviña
2004 Hyperkalemia in Fatal MDMA (Ecstasy') Toxicity. International Journal of Cardiology 93(2-3):307-308

Ridpath, Alison, Cynthia R. Driver, Michelle L. Nolan, Adam Karpati, Daniel Kass, Denise Paone, Andrea Jakubowski, Robert S. Hoffman, Lewis S. Nelson, and Hillary V. Kunis
2014 Illnesses and Deaths Among Persons Attending an Electronic Dance-Music Festival — New York City, 2013. Morbidity and Mortality Weekly Report 63(50):1195-1198.

Russel S. Falck, Robert G. Carlson, Jichuan Wang, and Harvey A. Siegal
2004 Sources of Information About MDMA (3,4-methylenedioxymethamphetamine): Perceived Accuracy, Importance, and Implications for Prevention Among Young Adult Users. Drug and Alcohol Dependence 74:45–54.

Ryan, Gery and H. Russel Bernard
2003 Techniques to Identify Themes. Field Methods 15(1):85-109.

Sandelowski, Margarete
2000 Combining Qualitative and Quantitative Sampling, Data Collection, and Analysis Techniques in Mixed-Method Studies. Research in Nursing & Health 23:246-255.

2010 What's in a Name? Qualitative Description Revisited. Research in Nursing & Health 33(1):77-84.

Schensul, Jean J., Sarah Diamond, William Disch, Rey Bermudez, and Julie Eiserman
2005 The Diffusion of Ecstasy Through Urban Youth Networks. Journal of Ethnicity in Substance Abuse 4(2):39-71.

Schifano, Fabrizio
2004 A Bitter Pill. Overview of Ecstasy (MDMA, MDA) Related Fatalities. Psychopharmacology 173:242–248.

Sherlock K, Wolff K, Hay A, Conner M.
1999 Analysis of Illicit Ecstasy Tablets: Implications for Clinical Management in the Accident and Emergency Departments. Journal of Accident & Emergency Medicine 16:194-197.

Shildrick, Tracy
2002 Young People, Illicit Drug Use and the Question of Normalization. Journal of Youth Studies 5(1):35-48.

Shiner, Michael, and Tim Newburn
1997 Definitely, Maybe Not? The Normalization of Recreational Drug Use Amongst Young People. Sociology 31(3):511-529.

Smirnov, Andrew, Jake Najman, Margot Legosz, Helene Wells, and Robert Kemp
2013 Social Contacts and Ecstasy Offers: Findings of a Population-Based Study. Journal of Psychoactive Drugs 45(5):425-433.

Smith, Kelly, Lisa Larive, and Frank Romanelli
2002 Club Drugs: Methylenedioxymethamphetamine, flunitrazepam ketamine hydrochloride, and gamma-hydroxybutyrate. American Journal of Health-System Pharmacology 59(11):1067-1076.

South, Nigel and David Teeman
1999 Young People, Drugs and Community Life: The Messages from the Research. *In* Young People, Drugs and Community Safety. Alan Marlow and Geoffrey Pearson eds. Pp. 69-80. Lyme Regis: Russell House Publishing.

Stojanovska, Natasha, Shanlin Fu, Mark Tahtouh, Tamsin Kelly, Alison Beavis, and K. Paul Kirkbride
2013 A review of impurity profiling and synthetic route of manufacture of methylamphetamine, 3,4-methylenedioxymethylamphetamine, amphetamine, dimethylamphetamine and p-methoxyamphetamine . Forensic Science International 224:8-26.

Swist, M., J. Wilamowski, and A. Parczewski
2005 Determination of Synthesis Method of Ecstasy Based on the Basic Impurities. Forensic Science International 152(2-3):175-184.

Tanner, Zachary, Motoi Matsukura, Vesna Ivkov, Ashraf Amlani, and Jane Buxton
2014 British Columbia Drug Overdose & Alert Partnership Report. BC Drug Use Epidemiology. BC Centre for Disease Control.

Ten Have, Paul
2004 Understanding Qualitative Research and Ethnomethodology. Thousand Oaks: Sage Publications.

Trostle, James A.
2005 Epidemiology and Culture. Cambridge University Press. New York.

Umoquit, Muriah, Mark Dobrow, Louise Lemieux-Charles, Paul G. Ritvo, David R. Urbach, and Walter P. Wodchis
2008 The Efficiency and Effectiveness of Utilizing Diagrams in Interviews: An Assessment of Participatory Diagramming and Graphic Elicitation. BMC Medical Research Methodology 8(1):53-64.

United Nations Office on Drugs and Crime (UNODC)
2012 Global SMART Update. Report, 7.

2014a Global Synthetic Drugs Assessment: Amphetamine-type Stimulants and New Psychoactive Substances. New York: United Nations.

2014b World Drug Report. New York: United Nations.

Vaismoradi, Mojtaba, Hannele Turunen, and Terese Bondas
2013 Content Analysis and Thematic Analysis: Implications for Conducting a Qualitative Descriptive Study. Nursing and Health Sciences 15(3):398–405.

Van De Wingaart, Ruud Braam, Dick De Bruin, Marjolein Fris, N.J.M. Maalste, and H.T. Verbraeck
1999 Ecstasy Use at Large-Scale Dance Events in the Netherlands. Journal of Drug Issues 29(3):679-702.

Verschraagen, Miranda, Ann Maes, Bart Ruiter, Ingrid J. Bosman, Beitske E. Smink, and Klaas J, Lusthof
2007 Post-mortem Cases Involving Amphetamine-based Drugs in the Netherlands: Comparison with Driving Under the Influence Cases. Forensic Science International 170(2-3):163-170.

Vevelstad. Merete, Elisabeth Leere Øiestad, Gerrit Middelkoop, Inger Hasvold, Peer Lilleng, Gerd Jorunn M. DElaveris, Tormod Eggen, JØrg MØorland, and Marianne Amestad
2012 The PMMA Epidemic in Norway: Comparison of Fatal and Non- Fatal Intoxications 219(1-3):151-157.

Weber, Elke U.
2009 Risk Perception. *In* Encyclopedia of Medical Decision Making. Pp. 1010-1012. Michael W. Kattan, ed. Thousand Oaks: SAGE Publications, Inc.

Weir, Erica
2000 Raves: A Review of the Culture, the Drugs and the Prevention of Harm. Canadian Medical Association Journal 162(13):1843-8.

White, Bethany, Louisa Degenhardt, Courtney Breen, Raimondo Bruno, Jaclyn Newman, and Phoebe Proudfoot
2006 Risk and Benefit Perceptions of Party Drug Use. Addictive Behaviors 31:137–142.

Wilson, Hannah, Joanne Bryant, Martin Holt, and Carla Treloar
2010 Normalisation of Recreational Drug Use Among Young People: Evidence About Accessibility, Use and Contact With Other Drug Users. Health Sociology Review 19(2):164-175.

Winstock, Adam R., Kim Wolff, and John Ramsey
2001 Ecstasy Pill Testing: Harm Minimization Gone Too Far? Addiction 96:1139–1148.

Wood, Ralph, and Linda B. Synovitz
2001 The Agony of 'Ecstasy'. Education Digest 66(9):46-51.

Zhao, Jinhui, Kate Vallance, Gina Martin, Scott Macdonald, and Tim Stockwell
2014 Prevalence of Substance Use in Lifetime, Past Year and Past 30 Days in British Columbia and Other Provinces of Canada from 2008 to 2012. Report. Victoria: Centre for Addictions Research of British Columbia.

**Appendix 1: Recruitment Poster**



# PARTICIPANTS WANTED:

Do you use the drug Ecstasy?

I am looking for women who are 19 years or older and have used **Ecstasy** at least once per month for the last six months to participate in a study about Ecstasy use and purity in Victoria.

The interview takes about one hour and is **confidential** and **anonymous.** You will be compensated for your time.

For more information please contact:
Melanie, Principal Investigator.

## Appendix 2: Email Script

Hello,

Thank you for your interest in the study regarding ecstasy use. The interview takes about one hour to complete and I conduct the interviews in-person at the University of Victoria. First, I have some questions to make sure you are eligible for the study. If so, we can arrange a day and time to meet for the interview. I will contact you within 48 hours to let you know if you are eligible or not. Here are the questions:

1. How old are you?
2. What is your gender?
3. How often have you used ecstasy in the last six months?
4. Do you currently live in Victoria? If so, how long have you lived in Victoria?
5. Do you personally know the researcher, Melanie Callas? If yes, what is your relationship with her?

Thank you,
Melanie

## Appendix 3: Consent Form

University of Victoria | Anthropology

**Participant Consent Form**

---

**Social Influences on Risk Perceptions of Ecstasy Use and Purity**

You are invited to participate in a study entitled Social Influences on Risk Perceptions of Ecstasy Use and Purity that is being conducted by Melanie Callas. Melanie Callas is a graduate student in the department of anthropology at the University of Victoria. You may contact her by email if you have any questions or concerns about this study. As a graduate student, Melanie is required to conduct research as part of the requirements for the Master of Arts degree in anthropology. It is being conducted under the supervision of Dr. Eric Roth, and you may contact him at 250-721-6268. This research is being funded by the Social Sciences and Humanities Research Council.

**Purpose and Objectives**
The purpose of this research project is to learn about the use and purity of the drug ecstasy in Victoria and how friends influence an ecstasy user's risk perceptions of ecstasy use and purity. The study aims to reveal how ecstasy users decide if their ecstasy is pure and how ecstasy users' friends influence perceptions of risks associated with ecstasy impurity.

**Importance of this Research**
Research of this type is important because learning about the role social groups play in shaping risk perceptions of ecstasy use and purity can help researchers understand the connection between social networks and ecstasy use. This research has the potential to help protect ecstasy users from harms related to impure ecstasy because the research will reveal how ecstasy users decide if their ecstasy is pure and how ecstasy users' friends influence perceptions of risks associated with ecstasy impurity. This knowledge can inform education programs and harm reduction approaches.

**Participants Selection**
You are being asked to participate in this study because you have had experience using the drug ecstasy at least once per month during the past six months. You must be female, 19 years or older, speak and understand English, and have lived in Victoria for a minimum of six months. You were selected by the researcher to participate in this study because you meet all eligibility criteria.

**What is Involved**
If you agree to voluntarily participate in this research, the researcher will ask you questions about your ecstasy use, harms related to ecstasy, ecstasy purity, your sources of information on ecstasy purity, and your sources of ecstasy. You have the right to refuse any questions you do not want to answer and there will be no consequences for refusing to answer any questions. The interview will be approximately one hour long and will take place at the University of Victoria. The researcher will tape-record the interview and take notes during the conversation. Afterwards, the researcher will transcribe the interview and use the data to write her Master's thesis.

**Inconvenience**

Participation in this study is not expected to cause any inconvenience to you, except for the time required to participate. Taking part in this study will take approximately one hour of your time.

**Risks**
By taking part in this research, you might experience some emotional or psychological discomfort, fatigue, or stress in response to some of the questions about your drug use. You may refuse, for any reason, to answer any questions that make you feel uncomfortable, and there will be no consequences for refusing to answer any questions. If you would like to discuss your feelings or drug use, the interviewer has contact details of local social service and health agencies.

**Benefits**
You may benefit from participating in the research project because during the interview you will have the opportunity to reflect on your ecstasy use behaviours, which could be an insightful experience. Society and state of knowledge could benefit from the research because the research will contribute to social sciences data on drug risk perception. Learning about the role peer groups play in shaping risk perceptions of ecstasy use can help anthropologists and other researchers understand the connection between social networks and recreational ecstasy use. This information can benefit society by informing education programs directed at ecstasy users.

**Compensation**
As a way to compensate you for any inconvenience related to your participation, you will be given $40 cash. If you consent to participate in this study, this compensation must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If you would not participate if the compensation was not offered, then you should decline.

**Voluntary Participation**
Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you choose to withdraw from the study your data will not be used in the analysis and it will be destroyed immediately. If you decide you would like to withdraw from the study after you have completed the interview, you can email Melanie at mcallas@uvic.ca to tell her. To compensate you for your time and transportation costs, you will be offered $40. If, for any reason, you choose to withdraw during the interview or anytime thereafter, you will still receive the full compensation of $40 for your participation. It is important that receiving the money does not make you feel forced to take part in the study and that you would participate even without the compensation.

**Anonymity**
In terms of protecting your anonymity, I will use pseudonyms and other non-identifying descriptors during data collection, analysis, and dissemination of the results. I will not ask or collect your personal information, including your full name, address, date of birth, or any other information that would allow anyone to know later on that it was you who participated in the study. On this consent form, I will ask you to sign your initials instead of your full name to protect your anonymity. I will not include any personal or identifying information in the dissemination of the results.

**Confidentiality**

Your confidentiality and the confidentiality of the data will be protected because the paper records and audiotapes will be stored in a locked desk drawer and the electronic data (i.e. typed transcripts) will be stored on a password-protected computer. The data will not be stored with any identifying information because none will be collected from you. Only the researcher will have access to the data.

**Dissemination of Results**
It is anticipated that the results of this study will be shared with others in the following ways: Master's thesis presentations, presentations at scholarly meetings, and on the *UVicSpace* website.

**Disposal of Data**
All data from this study will be disposed of after the completion and defense of Melanie's Master's thesis in 2015. If a participant chooses to have their data removed from the study before this time, the participant's data will be destroyed immediately upon receiving this request. The audio recordings and electronic data will be deleted and the paper records will be shredded.

**Contacts**
You may contact Melanie Callas regarding the study or her supervisor Dr. Eric Roth at 250-721-6268. In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your initials below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

| ***Name of Participant*** | | ***Initials*** | | ***Date*** |
|---|---|---|---|---|

***A copy of this consent will be left with you, and a copy will be taken by the research.***

## Appendix 4: Interview Guide

### Interview Guide

In order to learn about the use and purity of ecstasy in Victoria, how friends influence ecstasy users' risk perceptions of ecstasy use and purity, and the strategies ecstasy users utilize to determine purity, I hope we can have a conversation about ecstasy for an hour or so. I will ask you questions about your ecstasy use, harms related to ecstasy, ecstasy purity, and general questions about your peer group. During the interview, I will tell you about data on ecstasy use collected by the Centre for Addictions Research of BC (CARBC) and show you some graphs that I made based on the data, so we can discuss them and I can get your interpretation of how they relate to what you know about Ecstasy. Please feel free to tell me if, for whatever reason, you feel uncomfortable and do not want to answer any of the questions. Similarly, if for any reason you wish to end the interview before completing it I can still provide your honorarium.
Before we start, do you have any questions?

**Descriptive Information**

To begin, I would just like to ask some questions about yourself.

1. How old are you?

2. What is the highest level of education you have completed?

3. Are you currently employed?
    a) Full-time, part-time, seasonal, unemployed, self-employed, casual worker?

4. How would you describe yourself?

**History of Ecstasy Use**

Thank you. Now I would like to discuss your personal ecstasy use history.

5. Can you describe ecstasy and what it is like to be high on ecstasy?
    a) *Prompt: describe the experience in relation to another drug*

6. What makes getting high on ecstasy fun?
    a) *Prompt: Does setting and who you are with matter*?

7. Can you tell me about the first time you used ecstasy?

   a) *Prompt: when, where, who, why, your experience*

8. Can you tell me about the most recent time you used ecstasy?

   *a) Prompt: when, where, who with, your experience*

   *b) Prompt: how was it different from your first time?*

9. Who are you usually with when you use ecstasy? Why?

10. Where do you usually use ecstasy? Why?

11. How often do you use ecstasy?

12. What influences how often you use ecstasy?

**Ecstasy and your Social Groups**

Next, this section asks questions about your social groups. I will show you some figures that we will discuss. I am interested in how the data in them relate to your experiences and your peer group.

***[Show Figure 1 on sources of ecstasy]*** This graph is based on data collected by CARBC's Canadian Recreational Drug Use Survey. In the survey, participants who had used ecstasy during the past 12 months were asked about their sources of ecstasy and these were the results: About **45**% said they got ecstasy from an unknown source during the last year, such as a stranger at a bar, while about **62**% reported they got ecstasy from a friend even though they don't know where their friend got it from.

13. What do you think of this graph?

   *a) Prompt: Do these data surprise you? Why or why not?*

   *b) Prompt: What are the advantages and disadvantages of getting ecstasy from your friends?*

14. Would you take ecstasy from a stranger? For example, buying it from a stranger at a club? Why or why not?

a) *Prompt: Have you done this?*

1. *If yes,* can you explain the situation? (*Prompt: when, where, why)*

***[Show Figure 2 on social networks]*** Imagine this diagram illustrates your social network with the inner circle representing your closest friends, the middle circle representing your friends, and the outer circle representing your acquaintances. (*Acquaintance = a person you are familiar with but you do not necessarily consider them a friend. Ex: friend of a friend or a classmate).* You can tell me about anyone you want, but I will ask you to tell me details about individuals who live in Victoria and attend parties, raves, or clubs because that is what my research is focusing on.

15. Tell me about each of these groups.

16. Now, thinking about individuals who attend parties, raves, or clubs, tell me about each of these groups.
    a) *Prompt: Why do you consider them your closest friends, friends, and acquaintances?*

    b) *Prompt: What is the difference between these groups of people?*

    c) *Prompt: Are your acquaintances considered acquaintances because they don't use ecstasy or are your best friends your best friends because they do use ecstasy?*

17. Do people in each of these groups use ecstasy*?*
    a) *Prompt: What proportion of each group uses ecstasy?*

18. Do they use ecstasy regularly?
    a) *Prompt: What proportion of each group uses ecstasy regularly?*

19. Do you use ecstasy with people from each of these groups? Why or why not?

20. Do you use ecstasy with people not represented in this diagram?

21. Do people in each of these groups know you use ecstasy? Why or why not?
    a) *Prompt: Would your use of ecstasy end any of your friendships?*

22. Are you concerned or have you been concerned about any of these people's ecstasy use? Why or why not?
    a) *Prompt: What amount or level of ecstasy use do you think is acceptable or sensible and why?*

b) *Prompt: Would a certain amount of ecstasy use change or break any friendships?*

c) *Prompt: What types of use would worry you?*

23. How does each group feel about your ecstasy use?
    a) *Prompt: Has anyone ever expressed concern about your ecstasy use? Why or why not?*
        1. *If yes, how did you respond or react?*
        2. *If yes, do they use ecstasy themselves*?

24. How do people who don't use ecstasy feel about your ecstasy use?

25. How do people who use ecstasy feel about your ecstasy use?

26. Have you bought or received ecstasy from any of these groups of people? Why?
    a) *Prompt: Gift or purchased?*

27. Would you take ecstasy from any of these groups even if you didn't know whom they got it from? Why or why not?
    a) *Prompt: Have you done this?*
        1. *If yes,* can you explain the situation? (*Prompt: when, where, why)*
        2. *If no, what if they had tried it and said it was 'good'?*

**Harms**

This next section asks about possible harms related to ecstasy use. I will show you a graph that we will discuss.

***[Show Figure 3 regarding minimizing risk of harm]*** This graph is also based on data collected by CARBC's Canadian Recreational Drug Use Survey. In the survey, participants who had used ecstasy during the past 12 months were asked what strategies they use to potentially prevent harms caused by ecstasy use. **74%** of participants reported that they discuss purity with friends, **33%** check websites like erowid.org, **17%** use a testing kit, **3%** access harm reduction services, and **0%** own a testing kit.

28. What do you think of this graph?
    a) *Prompt: Do these data surprise you? Why or why not?*

    b) *Prompt: Do you discuss the purity of ecstasy with your friends? Why or why not? What are advantages and disadvantages to this?*

29. Are there things people should be concerned about when they use ecstasy?

    a) *Prompt: Example of harm?*

30. Have you ever experienced any harm from using ecstasy?

    a) *If yes***,** please describe the experience(s) *(Prompt: what, when, where, why?)*

31. Has anyone you know experienced harm from using ecstasy?

    a) *If yes,* please describe the experience(s) *(Prompt: what, when, where, why?)*

32. What strategies do your friends use to minimize potential harms associated with using ecstasy?

    a) *Prompt: do you or your friends use these strategies? Why or why not?*

**Ecstasy Purity**

Next I would like to ask your opinions and perspectives on the issue of ecstasy purity.

33. What does ecstasy purity mean to you?

34. Have you ever consumed ecstasy that you knew beforehand was not pure MDMA?

    a) *If yes…*

        1. How do you know it was not pure MDMA?
        2. Explain the situation (*Prompt: how often, when, where, why)*
        3. What substances do you think it contained?

35. How do you determine the purity of your ecstasy?

    a) *Prompt: Why do you do this?*

b) *Prompt: Can you determine the purity of ecstasy by its appearance? How?*

36. How do your friends determine the purity of their ecstasy?

37. What is the best way to find out the purity of ecstasy? Why is this the best way?

**Ecstasy Testing**

This final section is concerned with the topic of ecstasy testing.

38. Have you ever had your ecstasy tested by a laboratory or harm reduction services?
    a) *If yes*, what was your experience? *(Prompt: where, when, why, results)*
    b) *If no,* why not?

39. Have you ever used a home testing kit?
    a) *If yes…*
        1. Can you describe home testing kits to me?
        2. Tell me about the most recent time you used a testing kit. (*Prompt: why did you use it? Describe the context, procedure, results.)*
        3. How often do you use a testing kit?
        4. What type do you use?
        5. How did you learn how to use it?
        6. How did you find out about testing kits?
        7. Do you own a testing kit? Why?
            1. *If no (do not own a kit)…*
                i. Whose kit did you use?
                ii. Why don't you own your own kit?
    b) *If no (never used a testing kit)…*
        1. Why have you never used a testing kit?
        2. Do you know where you can buy or use one?

3. Do you know how much they cost?

40. What do you think of ecstasy testing kits?
    a) *Prompt: Are they reliable? Informative? Accessible?*

Thank you very much for your time and the information you provided.

**Discussion**

41. Do you have any questions or comments?
42. Are there any issues that I didn't ask you about regarding ecstasy that you would like to discuss?

**Figure 1: Sources of Ecstasy During the Past 12 Months, CRDUS Data 2012**
Participants who had used ecstasy during the past 12 months were asked about their sources of ecstasy. About **45**% said they got ecstasy from an unknown source during the last year, such as a stranger at a bar, while about **62**% reported they got ecstasy from a friend even though they don't know where their friend got it.

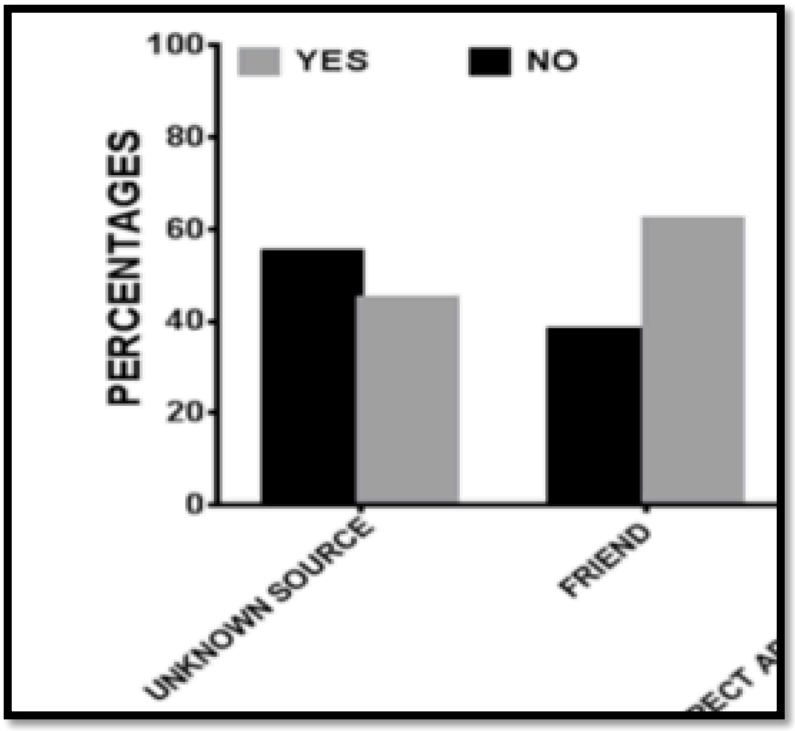


**Figure 2: Social Group Diagram**
Imagine this diagram represents your social network:

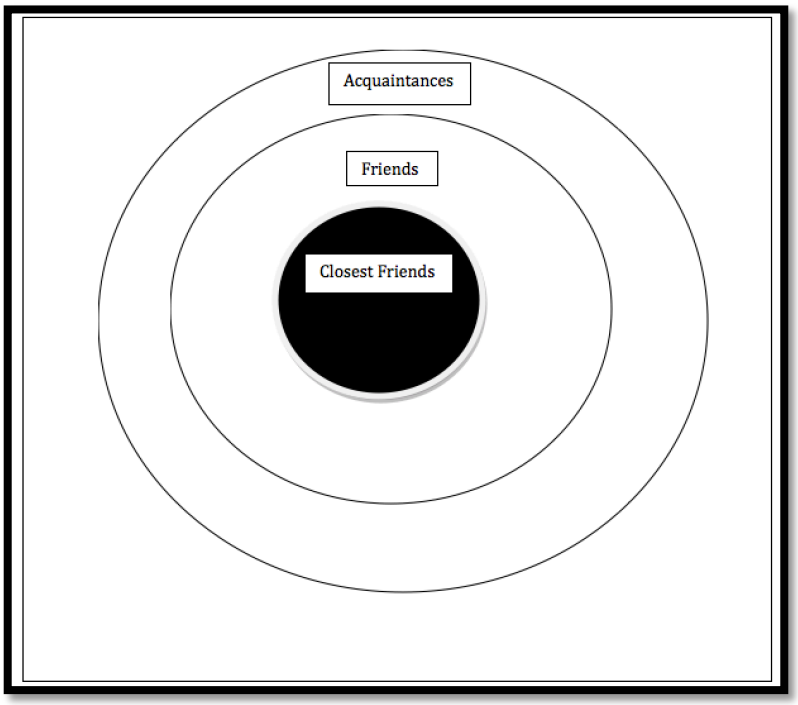



**Figure 3: Steps to Minimize Risk of Harm from Ecstasy, CRDUS Data 2012**
Participants who had used ecstasy during the past 12 months were asked what strategies they use to potentially prevent harms caused by ecstasy use. **74%** of participants reported that they discuss purity with friends, **33%** check websites like erowid.org, **17%** use a testing kit, **3%** access harm reduction services, and **0%** own a testing kit.